

BC 19-08
GENERAL INSTRUCTIONS, CONDITIONS AND SPECIFICATIONS FOR THE CITY OF BATTLE CREEK

TABLE OF CONTENTS

SECTION I - GENERAL INSTRUCTION TO BIDDERS2

SECTION II –GENERAL CONDITIONS OF CONTRACT10

SECTION III - REQUIREMENTS FOR FEDERAL PROJECTS.....37

SECTION IV - GENERAL SPECIFICATION FOR WATERMAIN46

SECTION V - GENERAL SPECIFICATION FOR SANITARY SEWER.....60

SECTION I - GENERAL INSTRUCTION TO BIDDERS

TABLE OF CONTENTS

1.	EXAMINATION OF SITE AND CONTRACT DOCUMENTS.....	3
2.	INTERPRETATION OF CONTRACT DOCUMENTS.....	3
3.	MAKEUP OF CONTRACT DOCUMENTS	3
4.	ORDER OF PRECEDENCE.....	4
5.	EQUIPMENT GUARANTIES.....	4
6.	STANDARD MANUFACTURER.....	4
7.	MATERIAL SUBSTITUTION	4
8.	MATERIAL TESTS.....	4
9.	WORK BY CONTRACTOR'S FORCES	5
10.	PREPARATION OF PROPOSAL	5
11.	APPROXIMATE QUANTITIES	5
12.	SUPPLEMENTAL SCHEDULE OF UNIT PRICES FOR CONSTRUCTION CHANGES	5
13.	COMMENCEMENT AND COMPLETION OF WORK	5
14.	SIGNING OF PROPOSALS	5
15.	BID SECURITY.....	5
16.	FILING OF PROPOSAL	6
17.	WITHDRAWAL OF PROPOSAL	6
18.	PUBLIC OPENING OF PROPOSALS.....	6
19.	QUALIFICATION OF BIDDERS	6
20.	DISQUALIFICATION OF BIDDERS	6
21.	AWARD OF CONTRACT	6
22.	CITY INCOME TAX	6
23.	EFFECTIVE DATE OF AWARD.....	6
24.	PENALTY FOR COLLUSION.....	6
25.	AGREEMENT, BONDS, INSURANCE.....	7
26.	EXECUTION OF AGREEMENT, & FILING OF BONDS & INSURANCE	7
27.	FAILURE TO EXECUTE AGREEMENT & FILE REQUIRED BONDS & INSURANCE.....	7
28.	FLEXIBILITY OF CONTRACT.....	7
29.	LEGAL DOCUMENTS.....	7
30.	NON-DISCRIMINATION.....	7
31.	CITY OF BATTLE CREEK - PAYMENT OF PREVAILING WAGES & FRINGE BENEFITS.....	8
32.	CONTRACT COMPLIANCE/AFFIRMATIVE ACTION PROGRAM	8
33.	MINORITY GOAL COMMITMENT	8
34.	COPELAND ANTI-KICKBACK ACT	8
35.	DISPUTES.....	8
36.	TERMINATION OF AGREEMENT	9

1. EXAMINATION OF SITE AND CONTRACT DOCUMENTS

- (a) Bidders shall inform themselves of all conditions under which the work is to be performed, concerning the site of the work, the structure of the ground, the obstacles which may be encountered, whether shown on the Contract Drawings or not, and all other relevant matters concerning the work to be performed.
- (b) A Contractor to whom a contract is awarded will not be allowed any extra compensation by reason of any such matters or things concerning which the Contractor did not inform himself prior to bidding. The successful Contractor must employ, as far as possible, such methods and means in the carrying out of this work as will not cause any interruption or interference with any other Contractors.
- (c) Bidders must satisfy themselves by personal examination of the locations of the proposed work and by such other means as they may prefer as to the correctness of any quantities listed in the proposal, and shall not, after submission of their proposal, dispute or complain of such estimate nor assert that there was any misunderstanding in regard to the nature or amount of work to be done.
- (d) Before submitting a proposal, each Bidder shall examine carefully the complete Contract Documents including but not limited to Invitation For Bids, Special Instructions to Bidders, Special Conditions, the Form of Agreement and Bonds, Project Specifications, Contract Drawings, General Contract Specifications Manual BC 19-08, current Specifications for Construction (MDOT) and all Addenda thereto, all of which contain provisions applicable not only to the successful bidder, but also to any of his subcontractors.
- (e) Each bidder is expected to base his bid on materials and equipment complying fully with the Contract Drawings and Specifications, and in the event he names or includes in his bid, materials or equipment which do not conform he will, if awarded a contract, be responsible for furnishing materials and equipment which fully conform at no change in his contract price.

2. INTERPRETATION OF CONTRACT DOCUMENTS

If any person contemplating submitting a bid on this project is in doubt as to the true meaning of any part of the Contract Drawings, Specifications or other Sections of the Contract Documents, he may submit to the Owner a written request within fourteen (14) calendar days of receipt of the document for an interpretation thereof. The person submitting the request will be responsible for its prompt delivery. Any interpretation of the Contract Documents including the Contract Drawings will be made only by addendum duly issued or delivered by the Owner to each person receiving a set of such documents. The Owner will not be responsible for any other explanations or interpretations of the Contract Documents including the Contract Drawings.

3. MAKEUP OF CONTRACT DOCUMENTS

The attention of prospective bidders is directed to the makeup of the Contract Documents on this project. The contract shall include Invitation For Bids, Special Instructions to Bidders, General Contract Specifications Manual BC19-08, current Specifications for Construction (MDOT), Proposal Forms, Contractor's Bid Bond Form, and Statement of Experience of Bidder; Special Conditions of Contract, Agreement Form, and Contractor's Forms; All Addendum's, Project Specifications, Contract Drawings, and Federal Wage Determination. It should be noted that:

- (a) Special Instructions to Bidders includes paragraphs which amplify the General Instructions to Bidders, as denoted in General Contract Specifications Manual BC 19-08.
- (b) Special Conditions of Contract includes paragraphs which amplify the General Conditions of Contract, as denoted in the General Contract Specifications Manual BC 19-08.
- (c) The Contract Specifications included in this document are divided into the major types of construction operations included under this Contract. The Section of Specifications included under each type of construction is designated as a Project Specification and the General Specifications are found in the General Contract Specifications BC 19-08. Both types of specifications become part of the contract document.
- (d) All forthcoming Addenda shall be part of the contract document.

Each General Specification in the General Contract Specifications Manual BC 19-08 covers the description of materials generally encountered in the construction carried out under the designated title of this specification and the installation of such materials. The Project Specifications and the Contract Drawings define the locations and details of the work required under this Contract and by reference to the succeeding General Specifications as denoted in the General Contract Specifications Manual BC 19-08 which materials and construction method is to be employed in each location. The Project Specifications also include specifications for all materials, equipment and construction methods for items not covered in the General Contract Specifications Manual BC 19-08.

4. ORDER OF PRECEDENCE

The Plans and specifications shall be considered to be one complete document and what is called for in one shall be considered as being called for in all. In the event that there is a conflict between the parts, the following order of precedence shall govern:

- Addenda to bidding documents
- The Contract Drawings
- The Contract Project Specifications
- The Contract General Specifications
- The Contract Special Instructions
- The Contract Special Conditions
- The City of Battle Creek General Contract 19-04

5. EQUIPMENT GUARANTIES

The attention of all bidders is directed to the condition that the Contractor and his Surety will be held responsible to the Owner that all items of equipment purchased and installed under his Contract fully meet the type, quality, design and the performance guaranties defined in the Contract Documents, and in actual operation satisfactorily perform the functions for which installed. Further, that the Owner may withhold final payment until such performance and operation is demonstrated.

It is suggested that the successful Contractor purchase all items of equipment under adequate guaranties or bonds from the manufacturers or suppliers to protect the obligation of the Contractor to the Owner on items of equipment. It should be noted that the shop drawings and details will not be reviewed by the Engineer until a form of guarantee acceptable to the Owner is submitted to the Engineer by each manufacturer or supplier through the Contractor.

6. STANDARD MANUFACTURER

Wherever the terms "standard", "recognized", or "reputable" manufacturer are used they shall be construed as meaning manufacturers who have been engaged in the business of fabricating materials, equipment or supplies of the nature called for by the Specifications for a reasonable period of time (12 months) prior to the date set for opening of bids, and who can demonstrate to the satisfaction of the Owner that said manufacturer has successfully installed equipment, materials, or supplies of the type proposed to be furnished in at least three instances, and that the performance of such materials, equipment or supplies has been satisfactory.

7. MATERIAL SUBSTITUTION

If restrictions of any Governmental Authority prohibit the purchase or use of certain items that are required by the Contract Drawings and Contract Specifications, substitution for such items will be determined by the Owner and the Engineer after the award of a construction contract.

Each Contractor shall base his bid on furnishing all items exactly as shown on the Contract Drawings and as described in the Contract Specifications. The successful Contractor will not be authorized to make any substitution on his own initiative, but in each and every instance must procure authorization from the Owner before installing any work in variance with the contract requirements.

8. MATERIAL TESTS

Attention of bidders is directed to the Material Tests which will be required on this project. All laboratory tests shall be made by a testing laboratory employed by the Owner. The costs of tests shall be paid by the Owner. The Contractor shall supply the required material, and the cost of these materials shall be merged in the prices stated on items which make up the Total Base Bid.

9. WORK BY CONTRACTOR'S FORCES

Attention of bidders is directed to the provision in the General Contract Specifications Manual BC 19-08 part of this Contract requiring that not less than a stated minimum percentage of on site construction must be performed by Contractor's forces.

10. PREPARATION OF PROPOSAL

Bids on this project may be submitted on the Proposal Forms furnished by the Owner and included in this document or on computer generated spread sheets previously approved by the City or MDOT. Bid prices in the Bidding Schedule are to be in figures. If any portion of the proposal is required to be given in unit prices and totals, the unit prices shall prevail, unless it clearly appears in the owners opinion that the unit prices rather than the totals are in error. If a discrepancies exists between the total base bid and the true sum of the individual bid items the true sum shall prevail. A proposal may be rejected if it does not contain a price for each and every item named in the Bidding Schedule.

Bidders are warned against making any erasures or alterations of any kind, and proposals which contain omissions, erasures, conditions, alterations or additions not called for may be rejected.

Only proposals which are made out on the regular Proposal Form included in this document will be considered. The Proposal Form must not be separated from this document.

11. APPROXIMATE QUANTITIES

On all items on which bids are to be received on a unit price basis, the quantities stated in the Proposals will not be used in establishing final payment due the Contractor. The quantities stated, on which unit prices are so invited, are approximate only, and each bidder shall make his own estimate from the Contract Drawings of the quantities required on each item, and calculate his unit price bid for each item accordingly. Bids will be compared on the basis of number of units stated in the Bidding Schedules set forth in the Proposals. Payment on the contract on unit price items will be based on the actual number of units installed on the completed work.

12. SUPPLEMENTAL SCHEDULE OF UNIT PRICES FOR CONSTRUCTION CHANGES

Where the Proposal Form requires a lump sum bid for a particular item (or items) and further requires bidder to submit a supplemental schedule of Unit Prices for possible construction changes in such item(s), the Owner may if it considers such Unit Prices reasonable include these prices in the Construction Contract. If the Owner considers such Unit Prices as unreasonable he may omit same from the Construction Contract.

Rejection at any time of such Unit Prices for Construction Changes as stated in the Proposal shall not otherwise affect the balance of the Proposal or Construction Contract.

13. COMMENCEMENT AND COMPLETION OF WORK

Attention of bidders is directed to the provision in the Proposal Form, included herewith, for time for starting work at the site of the project. Bidder shall specify the time he proposes to start work.

Attention of bidders is also directed to the time specified in the Proposal Form for the completion of the work. Bidder shall specify the time within which he proposes to complete the work. This will be considered in determining to whom to award a contract.

14. SIGNING OF PROPOSALS

If the bidder is a corporation, the legal name of the corporation shall be set forth together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation; if bidder is a co-partnership, the true name of the firm shall be set forth together with the signatures of all partners; and if bidder is an individual, his signature shall be inscribed. If signature is by an agent, other than an officer of a corporation or a member of a partnership, a power of attorney must be on file with the Owner prior to opening bids or submitting bids; otherwise, the bid may be disregarded as irregular and unauthorized.

15. BID SECURITY

No proposal will be considered unless accompanied by a Bid Security as defined in the Invitation For Bids, as a guarantee that if the bid is accepted the bidder will execute an Agreement and file bonds and insurance as required by the Contract Documents within fifteen (15) days from the date of the award of the contract.

All bid securities will be held until the Agreement has been executed by the successful bidder and he has filed with the Owner the required bonds and insurance, after which bid securities will be returned to the respective bidders. Bid Bond form is provided.

16. FILING OF PROPOSAL

Each Proposal, properly signed, together with the bid security, all addenda, and all documents bound herewith, shall be enclosed in a sealed envelope or package addressed and entitled as specified in the Notice to Bidders and delivered to the office designated in the Invitation For Bids. The Proposal must not be removed from these bound documents.

17. WITHDRAWAL OF PROPOSAL

Any Proposal may be withdrawn at any time prior to the hour fixed in the Invitation For Bids for the opening of bids, provided that a request in writing, executed by the bidder, or his duly authorized representative, for the withdrawal of such bid is filed with the Owner prior to the time specified for opening of bids. The withdrawal of a bid will not prejudice the right of a bidder to file a new proposal.

18. PUBLIC OPENING OF PROPOSALS

Proposals will be opened and the prices bid will be read aloud publicly at the time and place indicated in the Notice to Bidders. Bidders or their agents are invited to be present.

19. QUALIFICATION OF BIDDERS

It is the intention of the Owner to award a contract only to a bidder who furnishes satisfactory evidence that he has the requisite experience and ability and that he has sufficient capital, facilities and plant to enable him to prosecute the work successfully and promptly, and to complete the work within the time named in the Contract Documents.

To determine the degree of responsibility to be credited to a bidder, the Owner will weigh any evidence that the bidder or personnel guaranteed to be employed in responsible charge of the work has or has not performed satisfactorily on other contracts of like nature and magnitude or comparable difficulty at similar rates of progress.

20. DISQUALIFICATION OF BIDDERS

More than one proposal for the work described in this Document, to be included under a Contract, from an individual, firm or partnership, a corporation or an association under the same or different names, will not be considered. Reasonable grounds for believing that any bidder is interested in more than one Proposal for the work contemplated will cause the rejection of all Proposals in which such bidder is interested. If there is reasonable grounds for believing that collusion exists among the bidders, the proposals of the participants in such collusion will not be considered.

21. AWARD OF CONTRACT

Award of the contract, if it be awarded, will be made as provided in the Advertisement for Bids within the time limit stated therein. The Owner reserves the right to reject any or all proposals.

22. CITY INCOME TAX

The Contractor shall be responsible for registering, withholding and paying city income tax on all employees performing work within the city limits of Battle Creek pursuant to Chapter 880.01 of the Codified Ordinance of Battle Creek.

23. EFFECTIVE DATE OF AWARD

If a contract is awarded by the Owner, such award shall be effective when formal notice of such award is signed by the authorized representative of the Owner and has been delivered to the intended awardee, or mailed to him at the main business address shown in his Proposal by some officer or agent of the Owner duly authorized to give such notice.

24. PENALTY FOR COLLUSION

If at any time it shall be found that the person, firm or corporation to whom the Contract has been awarded has, in presenting any bid or bids, colluded with any other party or parties, then the contract so awarded shall be null and void, and the Contractor and his sureties shall be liable to the Owner for all loss or damage which the Owner may suffer thereby, and the Owner may advertise anew for bids for said work.

25. AGREEMENT, BONDS, INSURANCE

The attention of bidders is specifically directed to the forms of Agreement and Bonds to be executed and types of insurance to be taken out in the event a contract award is made.

26. EXECUTION OF AGREEMENT, & FILING OF BONDS & INSURANCE

Copies of the Agreement in the number stated in the Form of Agreement shall be executed by the successful bidder, and returned, together with the required bonds and insurance, within fifteen (15) days from and after the date of Commission acceptance of the Contract.

27. FAILURE TO EXECUTE AGREEMENT & FILE REQUIRED BONDS & INSURANCE

Failure of a successful bidder to execute the agreement and file required bonds and insurance within the required time shall be just cause for the annulment of the award. On failure of a successful bidder to execute the agreement and file the required bonds and insurance within the required time, he shall forfeit his bid security as agreed as liquidated damages, and the bidder, by filing a proposal, agrees to this provision. Upon annulment of an award as aforesaid, the Owner may then award a contract to the next lowest responsible bidder.

28. FLEXIBILITY OF CONTRACT

The actual work performed under this contract may be increased 50% or decreased 25%.

29. LEGAL DOCUMENTS

All bidders will furnish to the City of Battle Creek copies of the following documents:

- (a) If the Contractor is a single proprietorship, a sworn affidavit to such effect.
- (b) Co-Partnership - A copy of the Articles of Co-Partnership to which is attached a certificate signed by one of the partners to the effect that said Articles of Co-Partnership are then in full force and effect. This certificate shall also state whether or not a Certificate of Co-Partnership has been filed in compliance with the laws of the State of Michigan.
- (c) Corporations - A certificate establishing the fact that said corporation is in good standing under the laws of the State of Michigan, procured from the Michigan Corporation and Securities Commission.

30. NON-DISCRIMINATION

The contractor, subcontractor, vendor or supplier, hereinafter referred to as the "contractor", will not discriminate against any employee or applicant for employment because of race, religion, color, national origin, age* or sex*. The contractor will take affirmative action to insure that applicants are employed and that employees are treated during employment, without regard to their race, religion, color, national origin, age*, sex*, height, weight, marital status, handicap, or arrest record. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment advertising, layoff or termination; rates of pay or other forms of compensation, and selection for training, including apprenticeship.

The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, national origin, age*, sex*, height, weight, marital status, handicap or arrest record in compliance with Executive Order 11246 of September 24, 1964 entitled Equal Employment Opportunity as amended by Executive Order 11375 of October 13, 1967 and as supplemented in Department of Labor regulations (41 CFR Part 60).

The contractor will furnish and file compliance reports with the Michigan Civil Rights Commission upon request. Such reports shall elicit information as to the practices, policies, program and employment statistics for the contractor and each subcontractor and said contractor and subcontractor** shall permit access to all books, records, and accounts regarding employment practices by agents and representatives of the state duly charged investigative duties to assure compliance with this clause.

Breach of the covenants herein may be regarded as a material breach of the contract, or purchasing agreement, as provided in Public Act 453, 1976, as amended and may be processed thereunder.

The contractor will include, or incorporate by reference, the provisions of the foregoing paragraphs in every subcontract or purchase order unless exempted by the rules, regulations or orders of the Michigan Department of Civil Rights** and will provide in every subcontract or purchase order that said provisions will be binding upon each subcontractor or seller.

* See Public Act 453, 1976 as amended, Article 2, Sec. 202 (1).

Sec. 202. (1) An Employer shall not:

- (a) Fail or refuse to hire, or recruit, or discharge, or otherwise discriminate against an individual with respect to employment, compensation, or a term, condition or privilege of employment, because of religion, race, color, national origin, age, sex, height, weight, or marital status.
- (b) Limit, segregate, or classify an employee or applicant for employment in a way which deprives or tends to deprive the employee or applicant of an employment opportunity, or otherwise adversely affects the status of an employee or applicant because of religion, race, color, national origin, age, sex, height, weight, or marital status.
- (c) Segregate, classify, or otherwise discriminate against a person on the basis of sex with respect to a term, condition, or privilege of employment, including a benefit plan of system.

Except for contracts entered into with parties employing less than three (3) employees.

31. CITY OF BATTLE CREEK - PAYMENT OF PREVAILING WAGES & FRINGE BENEFITS

The City of Battle Creek has passed an ordinance which requires that no initial contract, agreement, understanding or other arrangement which exceeds \$500,000 Contractors must include the latest Wage Determination wage scales in their bid price for all initial contracts/agreements exceeding \$500,000.

If applicable, the Contractor may obtain the latest wage determination upon request to either the Contract Compliance Office or Purchasing Office.

No contract, agreement, understanding or other arrangement, whether oral or written, for the performance of services or work for and on behalf of the City of Battle Creek, involving craftsmen, mechanics and laborers employed directly upon the site of the work shall be entered into, approved or executed unless such contract, agreement, understanding or arrangement requires that all craftsmen, mechanics and laborers so employed shall receive at least the prevailing wages and fringe benefits for corresponding classes as determined and published by the Davis-Bacon Division of the United States Department of Labor for the greater Battle Creek area. In addition, such contract, agreement, understanding or arrangement shall provide that all subcontracts entered into by the Contractor, and all such contracts, agreements, understanding or arrangements shall provide that all contractors and subcontractors engaged in the performance of services or work for the City to which this applies shall, at the request of the City, furnish proof satisfactory to the City that the foregoing provisions of such contract and subcontract are being complied with.

32. CONTRACT COMPLIANCE/AFFIRMATIVE ACTION PROGRAM

The City of Battle Creek is committed to a Contract Compliance/Affirmative Action Program to ensure that all citizens have the opportunity for the equality of treatment in service and employment. All bidders doing business with the city in the amount of \$10,000 or more during any fiscal year shall comply with the provisions of the Contract Compliance plan. Completed Contract Compliance forms must be returned with the bid document.

33. MINORITY GOAL COMMITMENT

Pursuant to Resolution 495 of 1995, all contracts, agreements understanding or other arrangements, whether oral or written, over ten thousand dollars (\$10,000) for the performance of service or work for and on behalf of the City of Battle Creek involving craftsmen, mechanics, and laborers employed directly upon the site of work, shall be performed by contractors or subcontractors who have, as a goal, the employment of ten percent (10%) minority workers on the site of the job.

34. COPELAND ANTI-KICKBACK ACT

Copeland Anti-Kickback Act Title 18, U.S.C. June 25, 1948 Section 874, Kickbacks from Public Employees: Whoever, by force, intimidation, or threat of procuring dismissal from employment, or by any other manner whatsoever induces any person employed in the construction, prosecution, completion, or repair of any public building, public work, or building or work financed in whole or in part by loans or grants from the United States, to give up any part of the compensation to which he is entitled under his contract of employment, shall be fined not more than \$5,000 or imprisoned not more than five (5) years, or both."

35. DISPUTES

Except as otherwise provided in the Contract, any dispute concerning a questions of fact arising under the Contract which is not disposed of by agreement shall be decided by the City of Battle Creek's Project Manager who shall reduce his/her decision to writing and mail or otherwise furnish a copy thereof to the Contractor. The decision of the Project Manager shall be final, unless determined by a court of competent jurisdiction to have been

fraudulent or capricious or arbitrary or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence. In connection with any appeal proceeding under this clause, the Contractor shall be afforded an opportunity to be heard and to offer evidence in support of its appeal. Pending final decision of a dispute thereunder, the Contractor shall proceed diligently with the performance of the Contract and in accordance with Project Manager's decision.

This clause does not preclude consideration of law questions in connection with decision provided for in this clause, provided that nothing in this Contract shall be construed as making final the decision of any administrative official, representative or board on a question of law.

36. TERMINATION OF AGREEMENT

This agreement may be terminated for reasons of convenience or default.

- (a) Termination for Convenience: The City of Battle Creek may terminate this Agreement, in whole or in part, at any time by written notice to the Contractor. The Contractor shall be paid its costs, including Contract closeout costs and profit on work performed up to the time of termination. The Contractor shall promptly submit its termination claim to be paid the Contractor. If the Contractor has any property in its possession belonging to or paid for by the City of Battle Creek, the Contractor will account for same, and dispose of it in the manner the City of Battle Creek directs.
- (b) Termination For Default: If the Contractor does not deliver the complete Project in accordance with this Agreement or if the Contractor fails to comply with any other provisions of the Agreement, The City of Battle Creek may terminate, revoke or rescind this Agreement for default. Termination, revocation or rescission shall be effected by serving notice on the Contractor setting forth the manner in which the Contractor is in default. The Contractor will only be paid the Contract price for the portions of the Project furnished, accepted, and found in compliance with the terms and conditions of this Agreement.

If it is later determined by the City of Battle Creek that the Contractor has an excusable reason for not performing, such as a strike, fire or flood, events which are not the fault of, or are beyond the control of the Contractor. The City of Battle Creek, after setting up a new delivery or performance schedule, may allow the Contractor to continue work, or treat the termination as a termination for convenience.

Termination, revocation or recession of this Agreement for default shall not affect or impair any rights or claims of the City of Battle Creek to damages for breach of any covenants of this Agreement by the Contractor. Further, should the Contractor fail to comply with the conditions of the Agreement or fail to complete the specified work or furnish the specified services as stipulated in the Agreement, the City of Battle Creek reserves the right to purchase on the open market, or to complete the required work at the expense of the Contractor and to pursue all other recoveries available to the City of Battle Creek under Michigan law. In the event of a dispute under this Agreement, the City of litigations shall be Calhoun County, Michigan.

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SECTION II –GENERAL CONDITIONS OF CONTRACT

TABLE OF CONTENTS

I.	GENERAL CONDITIONS.....	12
1.	Definitions	12
2.	Contract Documents Defined	13
3.	Abbreviations Used	13
4.	Contractor's Bonds.....	14
5.	Contractor's Insurance	15
6.	Titles and Headings	16
7.	Progress Schedule and Reports	16
8.	Location of Existing Utilities and Piping	16
9.	Soil Boring Data	17
10.	Labor Provisions	17
11.	Notice of Starting Work	17
12.	Effect of Extension of Time	17
13.	Extra Work	17
14.	Assignment of Contract.....	17
15.	Subcontractors	18
16.	Discrepancies.....	18
17.	Liability of Owner's Representatives and Officials	18
18.	Effect of Inspection and Payments	18
II.	LEGAL RELATIONS AND RESPONSIBILITY	18
1.	Laws to be Observed	18
2.	Provisions of Law	18
III.	RESPONSIBILITIES AND RIGHTS OF CONTRACTOR.....	19
1.	Deliveries to Contractor.....	19
2.	Office of Contractor at Site.....	19
3.	Attention to Work.....	19
4.	Work Which May Not be Subcontracted	19
5.	Patents	19
6.	Access to Work	20
7.	Construction Site.....	20
8.	Signs	20
9.	Construction Photographs	20
10.	Liability of Contractor	20
11.	Assumption of Risks.....	21
12.	Responsibility for Damage	21
13.	Protection of Persons and Property	21
14.	Protection of Contractor's Work and Property	21
15.	Protection of Existing Structures.....	22
16.	Maintenance of Traffic.....	22
17.	Preservation of Stakes and Marks	22
18.	Approval of Contractor's Plans.....	22
19.	Suggestions to Contractor	22
20.	Licenses, Permits and Regulations.....	22
21.	Taxes.....	22
22.	Construction Utilities	23
23.	Cooperation.....	23
24.	Subcontractors	23
25.	Termination of Unsatisfactory Subcontractors	23
26.	Records of Employees and any Federal Reporting Methods	23
27.	Removal of Condemned Materials and Structures	23
28.	Errors and Omissions.....	24
29.	Proof of Compliance with Contract	24
30.	Cleaning Up	24

GENERAL CONDITIONS OF CITY CONTRACTS

31.	Final Guaranty.....	24
32.	Ownership of Drawings and Records	24
33.	Right of Review	24
IV.	RESPONSIBILITY AND RIGHTS OF OWNER.....	25
1.	Surveys and Staking	25
2.	Rights-of-Way	25
3.	Authority of the Engineer.....	25
4.	Inspection.....	25
5.	Retention of Imperfect Work	26
6.	Changes in Work.....	26
7.	Additional Drawings by Owner	26
8.	Emergency Protection.....	26
9.	Suspension of Work	26
10.	Right of Owner to Terminate Contract	27
11.	Termination of Agreement.....	27
12.	Placing Portions of Work in Service.....	27
13.	Sequence and Progress of Work	28
V.	WORKMANSHIP, MATERIALS AND EQUIPMENT	28
1.	Workmanship	28
2.	Interpretation of Specifications and Drawings	28
3.	General Quality of Materials	28
4.	Quality in Absence of Detailed Specifications	28
5.	Materials and Equipment Specified by Name	28
6.	Approval of Materials and Equipment	29
7.	Drawings of Equipment and Fabricated Materials	29
8.	Equipment Drawings	29
9.	Samples	30
10.	Tests.....	30
11.	Material Tests.....	30
12.	Storage of Materials	30
13.	Operating and Maintenance Instructions	31
14.	Compliance with State Safety Code	31
15.	Fuel Storage.....	31
VI.	PROSECUTION OF WORK	31
1.	Equipment and Methods	31
2.	Time of Completion	31
3.	Avoidable Delays	31
4.	Unavoidable Delays	32
5.	Notice of Delays	32
6.	Extension of Time	32
7.	Unfavorable Weather and Other Conditions	33
VII.	PAYMENTS AND CONTRACT COMPLETION	33
1.	Progress Estimates and Payments.....	33
2.	Alterations, Omissions and Extra Work	33
3.	Owner's Right to Withhold Certain Amounts.....	33
4.	Compensation for Extra Work and Work Omitted.....	34
5.	Time for Completion of Contract.....	35
6.	Excess Cost of Field Engineering and Inspection for Time Extension	35
7.	Acceptance of Work	35
8.	Final Estimate, Final Contract Supplement & Payment.....	35

GENERAL CONDITIONS OF CITY CONTRACTS

I. GENERAL CONDITIONS

1. Definitions

Whenever any word or expression defined in this paragraph, or pronoun used in its stead, occurs in these Contract Documents, it shall have, and is mutually understood to have, the meanings hereinafter given unless the context clearly indicates otherwise.

- (a) "Contract Documents" or "Contract Document" shall mean and include all those documents listed and included under the definition of "Contract Documents" in these General Conditions.
- (b) "Contract" or "Construction Contract" means and includes all of the Contract Documents, referred to in the General Conditions, covering the performance of the work and the furnishing of all labor, equipment, materials and other property required for the doing of the work, and covering the doing of all other things required by said Contract Document.
- (c) "Instructions to Bidders" shall mean and include both the Special Instructions to Bidders and the General Instructions to Bidders which are bound herewith.
- (d) "Conditions", "Contract Conditions" or "Conditions of Contract" shall mean both the Special Conditions of Contract and the General Conditions of Contract which are bound herewith.
- (e) "General Conditions" or "General Conditions of Contract" shall mean and include those "General Conditions" which are bound herewith.
- (f) "Owner" or "City of Battle Creek" or "City" shall mean the City of Battle Creek, Michigan, acting through the City Commission or any other board, official or officials to which or to whom the power belonging to the Commission shall by virtue of any act or acts thereafter passed are held to appertain.
- (g) "Specifications" or "Contract Specifications" shall mean and include all those "Contract Specifications" which are bound herewith, and which are listed, mentioned or referred to in the Special Conditions of Contract in the paragraph entitled "Contract Specifications", and include but are not limited to "Project Specifications" and "General Specifications".
- (h) "Contract Drawings" or "Plans" shall mean and include all drawings which have been prepared by or in behalf of the Owner, as a basis for proposals, when duly made a part of this Contract by incorporation or reference; all drawings submitted in pursuance of the terms of this Contract by the successful bidder with their proposal and by the Contractor to the Owner if and when approved by the Engineer; and all drawings submitted by the Engineer to the Contractor during the progress of the work as provided for in the Contract.
- (i) "Work" or "Project" shall mean and include the doing of all things required of the Contractor under the Contract Documents, including but not limited to the furnishing, construction and installation of all equipment, facilities and improvements therein mentioned, and the furnishing of all labor, materials, equipment, tools and other things necessary therefore, all as provided by the Contract Documents.
- (j) "Contractor" or "Construction Contractor" shall mean the party to whom the Contract for the work described in the Contract Documents has been awarded and who executes the Agreement for the doing of the work covered by the Contract.
- (k) "Subcontractor" shall mean a person, firm or corporation, other than the Contractor, supplying labor and materials, or labor only, at the site of the work.
- (l) "Inspector" shall mean the engineering or technical inspector or inspectors duly authorized or appointed by the Engineer or by the Owner, limited to the particular duties entrusted to him or them.

GENERAL CONDITIONS OF CITY CONTRACTS

- (m) "Date of Award" of Contract shall mean the date formal notice of such award, signed by the Owner, has been delivered to the intended awardee, or mailed to him at the main business address shown in their Proposal by some officer or agent of the Owner duly authorized to give such notice.
- (n) "Day" or "Days", unless herein otherwise expressly defined, shall mean working day or days.
- (o) "Where "as shown", "as indicated", and "as detailed", or words of similar import are used, it shall be understood that reference to the Contract Documents which are a part of the Contract Documents is made unless stated otherwise. Where "as directed", "as permitted", "approved", or words of similar import are used, it shall be understood that the direction, requirements, permission, approval, or acceptance of the Engineer is intended unless stated otherwise. "Provide" shall be understood to mean "provide complete in place", that is, "furnish and install".
- (p) Equipment supplier means the manufacturer who fabricates and/or assembly units to make up a complete equipment item. It does not mean a subcontractor who purchases an item of equipment from a manufacturer.

2. Contract Documents Defined

A Contract Document consists of and includes the following:

A. Volume

- (a) Invitation For Bids
- (b) Special Instructions to Bidders
- (c) Proposal
- (d) Special Conditions of Contract
- (e) Agreement
- (f) Contract Specifications including all documents, and papers included in or referred to in the foregoing.
- (g) The Bonds and Insurance Certificates and Policies.
- (h) General Instructions, Conditions and Specifications as denoted in General Manual BC 19-08.

B. Volume II Contract Drawings

C. Addenda Any and all Addenda to the foregoing.

3. Abbreviations Used

Wherever abbreviations are used in this Contract Document, each such abbreviation shall have the following listed meaning:

(a) Units of Measure

CY	Cubic Yard
Ft.	Feet
Lbs	Pounds
M	One Thousand
MFBM	One Thousand Feet Board Measure
C	Centigrade
F	Fahrenheit
HP	Horsepower
KVA	Kilovolt Ampere
BTU	British Thermal Unit

(b) Types and Units

PVC	Polyvinyl Chloride
MJ	Mechanical Joint
B & S	Bell and Spigot
T & G	Tongue and Groove
SS	Single Strength
DS	Double Strength

GENERAL CONDITIONS OF CITY CONTRACTS

VC	Vitrified Clay
RC	Reinforced Concrete
MH	Manhole
CB	Catchbasin
ES	Extra Strength

(c) Organizations and Publications

AASHTO	American Association of State Highway and Transportations Officers
ACI	American Concrete Institute
AGA	American Gas Association
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
AMCA	Air Moving and Conditioning Association, Inc.
ASA	American Standards Association, Inc.
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
AWI	Architectural Woodwork Institute
CS	Commercial Standard - U.S. Department of Commerce
FSS	Federal Supply Service
FM	Factory Mutual Laboratories
IBR	Institute of Boiler and Radiator Maintenance
MDOT	MI Department of Transportation
MRDTI	Metal Roof Deck Technical Inst.
MSS	Manufacturers Standardization Society of The Valve and Fitting Industry
NBBPVI	National Board of Boiler and Pressure Vessel Inspectors
NBFU	National Board of Fire Underwriters
NCPWB	National Certified Pipe Welding Bureau
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Assoc.
NLMA	National Lumber Manufacturers Association PCA Portland Cement Association
UL	Underwriters Laboratory
UBC	Uniform Building Code

4. Contractor's Bonds

The city reserves the right to approve the surety company. The surety company must have an A.M. Best's rating, or equivalent of "A".

- (a) Faithful Performance Bond: As a part of the execution of this Contract, the Contractor shall furnish to the Owner a bond payable to the Owner in the form of Faithful Performance Bond set forth herein, secured by a surety company acceptable to the Owner, conditioned upon the faithful performance of all covenants and stipulations under this contract. The amount of the bond shall be not less than One Hundred Percent (100%) of the total contract amount, as this sum is set forth in the Agreement. Further, this bond will act as a Defective Material Bond in an amount equal to One Hundred Percent (100%) of the total contract amount, to hold good for a period of one (1) year after the completion and acceptance of the work to protect the Owner against the results of defective materials, workmanship and equipment during that time.
- (b) Labor and Material Bond: As a part of the execution of this contract, the Contractor shall furnish to the Owner a bond of a surety company acceptable to the Owner in a sum of One Hundred Percent (100%) of the total contract amount, as this sum is set forth in the Agreement for the payment in full of all persons,

GENERAL CONDITIONS OF CITY CONTRACTS

companies or corporations who perform labor upon or furnish material to be used in the work under this contract. Said bond shall be in the same form as the form of Labor and Material Bond contained herein.

- (c) Notification of Surety Companies: The Contractor shall advise the surety companies and other signers of any of the bonds listed above to familiarize themselves with all of the conditions and provisions of this contract, and they shall waive the right to special notification or any change or modification of this contract or of extension of time, or of decreased or increased work, or of the cancellation of the contract or of any other act or acts by the Owner or its authorized employees and agents, under the terms of this contract and failure to so notify the aforesaid surety companies of changes shall in no way relieve the surety companies of their obligations under their contract.

5. Contractor's Insurance

The Contractor shall at the time of execution of this contract, file with the Owner the Certificate of Insurance, which shall cover all of their insurance as required herein, including evidence of payment of premiums thereon, and the policy or policies of insurance covering said Owner, the Engineer and their officers, agents and employees. Each such policy and certificate shall be satisfactory to the Owner and shall bear an endorsement precluding the cancellation or reduction in coverage without giving to the Owner at least thirty (30) days prior notice thereof in writing. Nothing contained in these insurance requirements is to be construed as limiting the extent of the Contractor's responsibility for payment of damages resulting from their operations under this Contract.

- (a) Public Liability and Property Damage Insurance: The Contractor shall take out, pay for and maintain until completion of the work required by this contract, public liability and property damage insurance (except automotive equipment) as shall protect him from claims for bodily injury and property damage which may arise because of the nature of the work or from operations under this contract.

The Contractor shall also name the Owner, the Engineer and their officers, agent and employees as additional insured to protect their interests. Both bodily injury and property damage insurance must be on an occurrence basis; and said policy shall provide that the coverage afforded thereby shall be primary coverage to the full limit of liability stated in the declarations, and if said Owner, or the Engineer and their officers, agents and employees have other insurance against the loss covered by said policy, that other insurance shall be excess insurance only.

The public liability and property damage insurance shall not be deemed to require the Contractor to have their subcontractors named as co-insured in their policy of public liability and property damage; but the policy shall protect him from contingent liability which may arise from operations of their subcontractors. Also, the Contractor shall secure certificates of insurance to provide coverage under this contract up to the limits as is required of the Contractor.

Each of said policies of insurance shall provide coverage in the following minimum amounts: For bodily injury, \$1,000,000 each person, \$1,000,000 each occurrence and \$1,000,000 aggregate limit; property damage, \$1,000,000 on account of any one occurrence with an aggregate limit of not less than \$1,000,000.

- (b) Comprehensive Automobile Liability: The Contractor shall also take out, pay for and maintain until completion and acceptance of the work required by this contract, automobile public liability and property damage insurance as shall protect him from claims for bodily injury or property damage which may arise from the use of motor vehicles engaged in various operations under this contract.

The policy or policies for automobile insurance shall provide coverage in the following minimum amounts: For bodily injury, \$1,000,000 each person, \$1,000,000 each occurrence and property damage, \$1,000,000 each occurrence.

At the option of Contractor, primary limits may be less than required, with an umbrella policy providing the additional limits needed. This form of insurance will be acceptable provided that the primary and umbrella policies both provide the insurance coverages herein required, and further provided that the umbrella policy minimum limits of coverage are \$1,000,000 per occurrence and \$1,000,000 aggregate. The umbrella coverage shall not apply to Owner's and Engineer's protective policy.

GENERAL CONDITIONS OF CITY CONTRACTS

- (c) Workers' Compensation Insurance: Before beginning the work, the Contractor shall furnish to the Owner satisfactory proof that he has taken out, for the period covered by the work under this contract, full compensation insurance for all persons which he may employ directly or through subcontractors in carrying out the work contemplated under this contract, and Employer's Liability Insurance and/or United States Longshoremen and Harbor Workers Compensation Act and Liability under Admiralty or Federal Jurisdiction. Such insurance shall be maintained in full force and effect during the period covered by this contract.

In addition to the insurance listed above, the Contractor shall take out and maintain during the life of this contract, Workers' Compensation Diseases Insurance for all persons whom he may employ directly or through subcontractors, in carrying out the work contemplated under this contract. Such insurance shall be maintained in full force and effect during the period covered by this contract.

- (d) Notification of Insurance Companies: The Contractor shall advise all insurance companies to familiarize themselves with all of the conditions and provisions of this contract, and insurance companies shall waive the right to special notification or any change or modification of this contract or of extension of time, or of decreased or increased work, or of the cancellation of the contract or of any other act or acts by the Owner or its authorized employees and agents, under the terms of this contract and failure to so notify the aforesaid insurance companies of changes shall in no way relieve the insurance companies of their obligation under this contract.
- (e) Hold Harmless Agreement: The Contractor shall defend, indemnify and save harmless the Owner, the Engineer and all of their officers, agents, and employees from all suits, actions or claims of any character brought for or on account of any injuries to or death of or damages received by any person, persons or property resulting from the operations of the Contractor or any of its subcontractors, in prosecuting the work under this contract.

6. Titles and Headings

The titles and subheadings printed on the Contract Drawings, in the Contract Conditions, in the Contract Specifications and elsewhere in the Contract Documents are inserted for the convenience of reference only, and shall not be taken or considered as having any bearing on the interpretation thereof.

7. Progress Schedule and Reports

Before beginning work, the Contractor shall file with the Engineer a proposed schedule of the work to be performed under this Contract and the date of commencing and finishing each. On sewer, water and paving projects where construction on two or more streets, roads or easements is contemplated, the Contractor shall also indicate the starting and completion date of all items of work required on each street, road or easement. On the last day of each calendar month two (2) copies of the schedule shall be submitted to the Engineer with notes thereon indicating the percentage of completion of each subdivision of the work on that date. The form of the schedule shall be approved by the Engineer.

8. Location of Existing Utilities and Piping

The location of existing piping and underground utilities, such as gas mains, water mains, electric duct lines, etc., as shown on the Contract Drawings, have been taken from the record drawings of the parent Utility Companies where available. However, the Owner does not assume responsibility for the possibility that during construction utilities other than those shown may be encountered or that actual location of those shown may be different from the locations designated on the Contract Drawings.

At the locations wherein detailed positions of these facilities become necessary to the new construction, the Contractor shall, at their expense, furnish all labor and tools to either verify and substantiate the record drawing location or definitely establish the position of the facilities.

Because of the nature of the work, adjustments may be required in new construction to meet existing conditions. Such adjustments shall be made by the Contractor without additional cost to the Owner.

GENERAL CONDITIONS OF CITY CONTRACTS

9. Soil Boring Data

Copies of results of soil borings, if borings were taken by the Owner in the vicinity of the proposed construction site, are available to the Contractor for inspection but are not a part of the Contract Documents. These borings are presented for whatever purpose the Contractor chooses to make of them. The Owner makes no representation or warrant regarding the number, location, spacing or depth of borings taken, nor of the accuracy or reliability of the information given in the results thereof. Further, the Owner does not assume responsibility for the possibility that during construction the soil and ground water condition may be different than indicated. Neither does the Owner assume responsibility for variations of soil and ground water at locations between borings. Contractors are required to make their own borings explorations and observations to determine soil and ground water conditions.

The Contractor shall plan the work based upon their own boring information.

10. Labor Provisions

(a) Labor Conduct. The Contractor shall employ none but competent and skilled workmen and foremen in the conduct of work on this contract. The Owner shall have the authority to order the Contractor to remove from the work any of Contractor's employees who refuse to obey instructions relating to the carrying out of the provisions and intent of the provisions of the contract, or who are incompetent, unfaithful, abusive, threatening or disorderly in their conduct, and any such person shall not again be employed on this project.

(b) Sunday, Holiday and Night Work. No work shall be done between the hours of 6:00 p.m. and 7:00 a.m., nor on Sundays or legal holidays, except such work as is necessary for the proper care and protection of work already performed or except in case of an emergency and, in any case, only with the permission of the Engineer.

It is understood, however, that night work may be established as a regular procedure by the Contractor if he first obtains the written permission of the Engineer, and that such permission may be revoked at any time by the Engineer if the Contractor fails to maintain at night adequate force and equipment for reasonable prosecution and to justify inspection of the work.

11. Notice of Starting Work

The Contractor shall notify the Engineer in writing forty-eight (48) hours before starting work at the site of the work of their intentions to do so. In case of a temporary suspension of work, he shall give reasonable notice before resuming work.

12. Effect of Extension of Time

The granting of any extension of time on account of delays which in the judgment of the Owner are avoidable delays shall in no way operate as a waiver on the part of the Owner of its rights under this Contract.

13. Extra Work

If extra work orders are given in accordance with the provisions of this contract, such work shall be considered a part hereof and subject to each and all of its terms and requirements.

14. Assignment of Contract

The Contract may not be assigned in whole or in part except upon the written consent of the Owner. Any assignment agreement shall be subject to review and approval by the Owner.

GENERAL CONDITIONS OF CITY CONTRACTS

15. Subcontractors

No subcontractor will be recognized as such, and all persons engaged in the work of construction will be considered as employees of the Contractor and he will be held responsible for their work, which shall be subject to the provisions of the contract.

16. Discrepancies

Anything called for by one of the Contract Documents and not called for by others shall be of like effect as if required or called for by all. Any discrepancies between any parts of the Contract Documents shall be called to the attention of the Engineer for decision before proceeding with the work affected thereby.

17. Liability of Owner's Representatives and Officials

No official or employee of the Owner, nor the Engineer, nor any authorized assistant or agent of any of them, shall be personally responsible for any liability arising under this contract. The Engineer shall not be responsible for construction means, methods, techniques, sequences or procedures, time of performance or for safety precautions and programs in connection with the construction work. The Engineer shall not be responsible for the Contractor's failure to carry out the work in accordance with the construction contract. The Engineer shall not be responsible for acts or omissions of the Contractor, any subcontractor, or any of their agents or employees, or any other persons performing the work.

18. Effect of Inspection and Payments

Neither the observation by the Engineer nor by any of their agents, nor by an inspector, nor any order, measurement, approved modification, certificate or payment of money, nor acceptance of any part or whole of work, nor any extension of time, nor any possession by the Owner or its agents, shall operate as a waiver of any provision of this contract or of any power reserved therein to the Owner, or any right to damages thereunder; nor shall the waiver of any breach of this contract be held to be a waiver of any other or subsequent breach. All remedies shall be taken and construed as cumulative.

II. LEGAL RELATIONS AND RESPONSIBILITY

1. Laws to be Observed

The Contractor shall keep himself fully informed of all existing and future Federal, State, County and Municipal laws, ordinances and regulations which in any manner affect those engaged or employed in the work or the materials used in the work or the conduct of the work or the rights, duties, powers or obligations of the Owner or of the Contractor or which otherwise affect the Contract, and of all orders and decrees of bodies or tribunals having any jurisdiction or authority over the same. He shall at all times observe and comply with, and shall cause all their agents, subcontractors and employees to observe and comply with, all laws, ordinances, regulations, orders and decrees; and shall protect and indemnify the Owner, the Engineer and all of their officers, agents and employees, against any claim, loss or liability arising or resulting from or based upon the violation of any such laws, ordinance, regulation, order or decree, whether by themselves or by their agents, subcontractors or employees. If any discrepancy or inconsistency is discovered in the plans, Contract Drawings, Contract Specifications or other Contract Documents for the work in relation to such laws, ordinance, regulation, orders or decree, the Contractor shall forthwith report the same to the Engineer.

2. Provisions of Law

It is specifically provided that this Contract is subject to all applicable laws and that the rules of law shall prevail over any provision contained in any of the Contract Documents which may be in conflict thereto or inconsistent therewith.

III. RESPONSIBILITIES AND RIGHTS OF CONTRACTOR

1. Deliveries to Contractor

Delivery by Owner, or any of its agents or representatives to Contractor of any drawings, samples, notices, letters, communications or other things may be made in either of the following manners, to wit: (a) by personal delivery to Contractor, (b) by personal delivery to Contractor's foreman or superintendent at the site of the work, (c) by delivery to the Contractor's business address specified in the Proposal or specified in a written notice of changed address delivered by Contractor to Owner, or (d) by delivery to the Contractor's office at the site of the work. Delivery to the Contractor's above mentioned business may be made either by personal delivery to such address or office or by depositing the thing to be delivered in the United States Mail, postage prepaid, addressed to such address or office.

2. Office of Contractor at Site

During the performance of this Contract, the Contractor may be requested to maintain a suitable office at the site of the work which shall be the headquarters of a foreman or superintendent authorized to receive drawings, instructions, or other communications, articles or things from the Owner or its agents, and any such thing given to the said foreman or superintendent or delivered to the Contractor's office at the site of the work in their absence shall be deemed to have been given to the Contractor.

3. Attention to Work

The Contractor shall direct the work using their best skill and judgment and shall give their personal attention to and shall supervise the work to the end that it shall be prosecuted faithfully, and when he is not personally present on the work, he shall at all times be represented by a competent superintendent or foreman who shall be present at the work and who shall receive and obey all instructions or orders given under this Contract, and who shall have full authority to execute the same, and to supply materials, tools and labor without delay, and who shall be the legal representative of the Contractor. The Contractor shall be solely responsible for all construction means, methods, techniques, sequences and procedures, time of performance and for safety precautions and programs and for coordinating all portions of the construction. The Contractor shall be liable for the faithful observance of any instructions delivered to him or to their authorized representative.

4. Work Which May Not be Subcontracted

Contractor shall give their personal attention to the fulfillment of the contract and shall keep the work under their control.

The Contractor shall perform with their own organization and with the assistance of workmen under their immediate supervision work of a value not less than thirty (30) percent of the value of all work embraced in this contract.

5. Patents

Except as may be otherwise provided in the Special Conditions of Contract, the Contractor shall assume all costs arising from the use of patented materials, equipment, devices or processes used on or incorporated in the work, and agrees to indemnify and save harmless the Owner, the Engineer, and their duly authorized representatives or employees, from all suits at law, or actions of every nature for, or on account of the use of any patented materials, equipment, devices or processes.

Should the Contractor, their agents, servants or employees or any of them be enjoined from furnishing or using any invention, article, material or appliance supplied or required to be supplied or used under this contract, the Contractor shall promptly offer other articles, materials, or appliances in lieu thereof, of equal efficiency, quality, finish, or appliances in lieu thereof, of equal efficiency, quality, finish, suitability and market value, for review by the Engineer. If the Engineer should disapprove the offered substitutes and should elect, in lieu of a substitution, to have supplied, and to retain and use, any such invention, article, material, or appliance as may by this contract be required to be supplied, the Contractor shall pay such royalties and secure such valid licenses as may be requisite and necessary for the Owner and its officers, agents and employees, or any of them to use such invention, article, material or appliance without being disturbed or in any way interfered with by any proceeding in law or equity on

GENERAL CONDITIONS OF CITY CONTRACTS

account thereof. Should the Contractor neglect or refuse to make any approved substitution promptly, or to pay such royalties and secure such licenses as may be necessary, then in that event the Engineer shall have the right to make such substitution, or the Owner may pay such royalties and secure such licenses and charge the cost thereof against any money due the Contractor from the Owner or recover the amount thereof from him and their sureties notwithstanding final payment under this contract may have been made.

6. Access to Work

The Contractor shall at all times provide proper facilities for access and inspection of the work by representatives of the Owner and of such official Governmental agencies as may be designated by the Owner as having jurisdictional rights to inspect the work.

7. Construction Site

(a) Use of Job Site

The Contractor shall confine their equipment, apparatus, the storage of materials, and operations of their workmen to limits indicated by the law, ordinances, permits or directions of the Owner, and shall not encumber other than the designated areas with their materials.

The Contractor shall not load or permit any part of a structure to be loaded with weight that will endanger its safety. The Contractor shall observe and enforce the Owner's instructions regarding signs, advertisements, fires and smoke.

(b) Use of Private Land

The Contractor shall not use any vacant lot or private land as a plant site, depository for materials, or as spill site, or for any other purpose without the written authorization of the owner of the land (or their agent), a copy of which authorization shall be filed with the Owner.

8. Signs

The Contractor shall place and maintain one or more sign boards as designated in Special Conditions of Contract. No other commercial or advertising signs will be allowed on the site of the work or on public property in the vicinity of the work. The layout of the sign shall be approved by the Engineer.

9. Construction Photographs

The Contractor shall provide no less than two (2) exposures at monthly intervals, during the construction period, construction photographs showing the progress of the work and of the exposed work completed under this contract. In addition, at the completion of the Contract, the Contractor shall provide no less than six (6) exposures of the completed work at the locations designated by the Engineer. All photographs shall be taken by a commercial photographer, shall be 4 x 5 inches film size, and shall indicate the date and the job title. Four prints, 8 x 10 inches, glossy, shall be furnished of each exposure. The photographer shall be equipped at all times to take either interior or exterior exposures. All 8 x 10 inch glossy prints of each exposure, together with all negatives, shall be delivered to the Engineer.

10. Liability of Contractor

The Contractor shall do all of the work and furnish all labor, materials, tools, and appliances, except as otherwise herein expressly stipulated, necessary or proper for performing and completing the work herein required in the manner and within the time specified in the Contract Documents. The mention of any specific duty or liability imposed upon the Contractor shall not be construed as a limitation or restriction of any general or other liability or duty imposed upon the Contractor by this contract, said reference to any specific duty or liability being made merely for the purpose of explanation.

The Contractor shall provide all items, materials, articles, operations or methods listed, noted, mentioned or scheduled on the drawings or in any of the Contract Documents, including all labor, material, plant, equipment, transportation and incidentals required and necessary for the completion of the work; and unless specifically shown

GENERAL CONDITIONS OF CITY CONTRACTS

otherwise herein all plant, equipment and other work shall be complete, in place and in operation. The Contractor shall be responsible to the Owner for the acts and omissions of all their employees and all subcontractors, their agents and employees, and all other persons performing any of the work under a contract with the Contractor.

11. Assumption of Risks

Until the completion and final acceptance by the Owner of all of the work under or implied by this Contract, the work shall be under the Contractor's care and charge and he shall be responsible therefore. The Contractor shall rebuild, replace, repair, restore and make good all injuries, damages, re-erection and repairs occasioned or rendered necessary by causes of any nature whatsoever, to all or any portions of the work, except as otherwise stipulated.

12. Responsibility for Damage

The Contractor shall assume the defense of, and indemnify and save harmless the Owner and each and every officer, employee and agent thereof, and the Engineer from any and all loss, liability or damage and from all suits, actions, damages or claims, of every name and description, to which the Owner or the Engineer or any of their officers, employees or agents may incur or be subjected or put by reason of injury to persons or property in the execution of the work or resulting from negligence or carelessness on the part of the Contractor, their employees, subcontractor or agents, in the delivery of materials, and supplies, or by or on account of any act or omission of the Contractor, their employees, subcontractors, or agents, including, but not limited to any failure to fulfill the terms of or comply with all laws and regulations which apply to this contract; and said Owner shall have the right to estimate the amount of such damage and pay the same, and the amount so paid for such damage shall be deducted from the money due the Contractor under their contract, or the whole or so much of the money due or to become due the Contractor under this contract, as may be considered necessary by the Owner, shall be retained by the Owner until such suits or claims for damages shall have been settled or otherwise disposed of, and satisfactory evidence to that effect furnished to the Owner.

The rights of the Owner under this contract in the control of the quality and completeness of the work shall not make the Contractor an agent of the Owner, and the liability of the Contractor for all damages to persons or to public or private property, arising from the Contractor's execution of the work, shall not be lessened because of the existence, exercise or non-exercise of such rights.

13. Protection of Persons and Property

The Contractor will be solely and completely responsible for conditions of the job site, including safety of all persons and property during the performance of the work. This requirement will apply continuously and not be limited to normal working hours.

The Contractor shall furnish such watchmen, guards, fences, warning signs, lights and walkways, and shall take all other precautions as shall be necessary, to prevent damage to persons or property. All structures and improvements in the vicinity of the work shall be protected by the Contractor, and if such property is damaged, injured or destroyed by the Contractor, their employees, subcontractors, or agents, it shall be restored to a condition as good as when he entered upon the work. The safety provisions of applicable laws, including but not limited to building and construction codes, shall be observed. Machinery, equipment, and all hazards shall be guarded (or hazards eliminated) in accordance with the safety provisions of the latest edition and any supplements thereto of the Manual of Accident Prevention in Construction, heretofore published by the Associated General Contractors of America, to the extent that such provisions are not in contravention to applicable law.

The duty of the Engineer to conduct construction observations of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures in, on or near the construction site or sites.

14. Protection of Contractor's Work and Property

The Contractor shall protect their work, supplies, and materials from damage due to the nature of the work, the action of the elements, trespassers or any cause whatsoever, until the completion and acceptance of the work.

GENERAL CONDITIONS OF CITY CONTRACTS

Neither the Owner nor any of its officers, employees or agents nor the Engineer assumes any responsibility for collecting indemnity from any persons or person causing damage to the work of the Contractor.

15. Protection of Existing Structures

Unless otherwise indicated on the Contract Drawings or unless otherwise taken care of by the Owner thereof, all utilities and all structures of any nature, whether below or above ground, that may be affected by the work shall be protected and maintained by the Contractor and shall not be disturbed or damaged by him during the progress of the work; provided that should the Contractor disturb, disconnect, or damage any utility or any structure, all expenses of whatever nature arising from such disturbance or the replacement or repair thereof shall be borne by the Contractor.

16. Maintenance of Traffic

Throughout the performance of the work or in connection with this contract, the Contractor shall construct and adequately maintain suitable and safe crossing over the trenches and such detours as are necessary to care for public and private traffic. The material excavated from trenches shall be compactly deposited along the sides of the trench or elsewhere in such manner as shall give as little inconvenience as possible to the traveling public, to adjoining property owners, to other contractors or to the Owner.

The traffic control devices used on construction, reconstruction and maintenance projects shall conform to the specifications, standards and criteria contained in the current edition of the Michigan Manual of Uniform Traffic Control Devices regarding design and application.

17. Preservation of Stakes and Marks

The Contractor shall preserve carefully all bench marks, reference points, and stakes, and in case he causes damage or disturbance, he will be charged with the resulting expense of replacement and shall be responsible for any mistakes that may be caused by their loss or disturbance.

18. Approval of Contractor's Plans

The absence of any exception taken by the Engineer of any drawing or any method or work proposed by the Contractor shall not relieve the Contractor of any of their responsibility for any errors therein and shall not be regarded as any assumption of risk or liability by the Owner or any officer or employee thereof, and the Contractor shall have no claim under the contract on account of the failure or partial failure or inefficiency of any plan or method so approved. No exception taken shall be considered to mean merely that the Engineer has no objection to the Contractor's using, upon their own full responsibility, the plans or methods proposed.

19. Suggestions to Contractor

Any plan or method of work suggested by the Engineer to the Contractor, but not specified or required, if adopted or followed by the Contractor in whole or in part, shall be used at the risk and responsibility of the Contractor; and the Engineer and the Owner shall assume no responsibility therefore.

20. Licenses, Permits and Regulations

The Contractor shall secure all Federal, State and local licenses required by law unless already obtained by the city. He shall obtain and pay for all necessary permits. He shall give all notices and comply with all laws, ordinances and regulations bearing on the conduct of the work as drawn and specified. If the Contractor observes that the drawings or Contract Specifications are at variance therewith, he shall promptly notify the Engineer in writing, and any necessary changes shall be adjusted as provided in the contract for changes in the work.

21. Taxes

Contractor shall, without additional expense to the Owner, pay all applicable Federal, State and local sales and other taxes, except taxes and assessments on the real property comprising the site of the project.

GENERAL CONDITIONS OF CITY CONTRACTS

22. Construction Utilities

The Contractor, for and in behalf of their work under this Contract shall provide and maintain all necessary utilities, such as water supply, electrical power, telephones, roads, fences, sanitary facilities, suitable storage places, etc., except as may be otherwise specifically stipulated in the Special Conditions of Contract. Sanitary facilities shall be suitable for those employed on this contract and of a type that will not create a public nuisance. He shall provide and maintain an adequate portable water supply for use of employees at the site of the work. Sanitary facilities and portable water supply shall be subject to approval of local and State Departments of Health.

23. Cooperation

The Contractor shall cooperate with all other contractors who may be performing work in behalf of the Owner and workmen who may be employed by the Owner on any work in the vicinity of the work to be done under this contract; and he shall so conduct their operation as to interfere to the least possible extent with the work of such contractors or workmen. He shall make good promptly at their own expense, any injury or damage that may be sustained by other contractors or employees of the Owner at their hands.

Any difference or conflict which may arise between the Contractor and other contractors, or between the Contractor and workmen of the Owner in regard to their work shall be adjusted and determined by the Engineer.

If the work of the Contractor is delayed because of any acts or omissions of any other contractor of the Owner, the Contractor shall on that account have no claim against the Owner other than for an extension of time.

24. Subcontractors

The Contractor shall notify the Owner in writing of the names of all subcontractors he proposes to employ on the contract and shall not employ any subcontractors until the Owner's approval has been obtained.

The Contractor agrees to be fully and directly responsible to the Owner for all acts and omissions of their subcontractors and of any other person employed directly or indirectly by the Contractor or subcontractors, and this contract obligation shall be in addition to the liability imposed by law upon the Contractor.

Nothing contained in this Contract Documents shall create any contractual relationship between any subcontractor and the Owner. It shall be further understood that the Owner will have no direct relations with any subcontractor. Any such necessary relations between Owner and subcontractor shall be handled by the Contractor.

The Contractor agrees to bind every subcontractor (and every subcontractor of a subcontractor, etc.) by all terms of the Contract Documents as far as applicable to the subcontractors' work unless specifically noted to the contrary in a subcontract approved in writing as adequate by the Owner.

25. Termination of Unsatisfactory Subcontractors

Should any subcontractor fail to perform in a satisfactory manner the work undertaken by him, such subcontract shall be terminated immediately by the Contractor upon notice from the Owner.

26. Records of Employees and any Federal Reporting Methods

The Contractor shall keep an accurate record showing the names, place of residence, citizenship, occupation and per diem pay, of each person engaged in the execution of the contract; and he shall cause every subcontractor under him, who shall undertake the performance of any part of the contract, to also keep a similar record of each person engaged in the execution of said subcontract. All such records shall be available at any time to the Engineer or duly authorized representative.

27. Removal of Condemned Materials and Structures

The Contractor shall remove from the site of the work, without delay, all rejected or condemned materials or structures of any kind brought to or incorporated in the work, and upon their failure to do so, or to make satisfactory progress in so doing within forty-eight (48) hours after the service of a written notice from the Engineer, the rejected

GENERAL CONDITIONS OF CITY CONTRACTS

or condemned material or work may be removed by the Owner and the cost of such removal shall be taken out of the money that may be due or may become due the Contractor on account of or by virtue of this contract. No such rejected or condemned material shall again be offered for use by the Contractor under this contract.

28. Errors and Omissions

If the Contractor, in the course of the work, finds any errors or omissions in the Contract Drawings, or in the layout as given by survey points and instructions, or if he finds any discrepancy between the Contract Drawings and physical conditions of the locality, he shall promptly notify the Engineer of the same for correction. Any work done after such discovery, until authorized, will be done at the Contractor's risk.

29. Proof of Compliance with Contract

In order that the Engineer may determine whether the Contractor has complied with those requirements of this contract, compliance with which is not readily ascertainable through inspection and tests of the work and materials, the Contractor shall, at any time requested, submit to the Engineer properly authenticated documents or other satisfactory proofs as to their compliance with such requirements.

30. Cleaning Up

The Contractor shall not allow the site of the work to become littered with trash and waste material, but shall maintain the same in a neat and orderly condition throughout the construction period. The Engineer shall have the right to determine what is or is not waste material or rubbish and the place and manner of disposal.

On or before completion of the work, the Contractor shall thoroughly clean all pits, pipes, chambers, or conduits which are a part of the work or premises which he has entered upon, shall tear down and remove all temporary structures built by him and shall remove rubbish of all kinds from any of the grounds he has occupied and leave them in a neat and clean condition.

31. Final Guaranty

All work shall be and is guaranteed by the Contractor for a period of one year from and after the date of final acceptance of the work by the Owner.

If, within said guaranty period, repair or changes are required in connection with guaranteed work, which, in the opinion of the Engineer, is rendered necessary as the result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the contract, the Contractor shall, promptly upon receipt of notice from the Owner, and without expense to the Owner (a) place in satisfactory condition in every particular all of such guaranteed work, correct all defects therein; and (b) make good all damage to the building or site, or equipment or contents thereof, which in the opinion of the Engineer, is the result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the contract; and (c) make good any work or material, or the equipment and contents of buildings, structure or site disturbed in fulfilling any such guarantee.

If the Contractor, after notice, fails within ten (10) days to proceed to comply with the terms of this guaranty, the Owner may have the defects corrected, and the Contractor and their surety shall be liable for all expense incurred, provided, however, that in case of an emergency where, in the opinion of the Engineer, delay would cause serious loss or damage, repairs may be made without notice being given to the Contractor and the Contractor shall pay the cost thereof.

32. Ownership of Drawings and Records

The City of Battle Creek shall retain all rights to data provided in this contract.

33. Right of Review

The City of Battle Creek or their grantor agency is duly authorized to examine any books, documents, papers and records of the contractor which are directly pertinent to the contract.

IV. RESPONSIBILITY AND RIGHTS OF OWNER

1. Surveys and Staking

The Engineer will provide control stakes for general layout and control grades for the construction work. It shall be the Contractor's responsibility to transfer the line and grade to finish grade as required. The Contractor will be held responsible for correct alignment and grade of projects constructed, and no claim for extra will be allowed for alleged inaccuracy of grade stakes. The Contractor shall give 48 hours notice for any staking required.

2. Rights-of-Way

The Owner will provide all rights-of-way and easements in or beneath which pipes and other structures will be constructed by the Contractor under this Contract.

3. Authority of the Engineer

The Engineer shall be an arbiter between the Owner and the Contractor.

All work done under this contract shall be done in accordance with the Contract Documents and in good workmanlike manner. To prevent disputes and litigation, the Engineer shall in all cases determine the amount, quality, acceptability, and fitness of the several kinds of work and materials which are to be paid for under this contract; shall decide all questions relative to the true construction, meaning, and intent of the Contract Specifications and the Contract Drawings; shall decide all questions which may arise relative to the classifications and measurements of quantities and materials and the fulfillment of this contract; and shall have the power to reject or condemn all work or material which does not conform to the terms of this contract. Their estimate and decision in all matters shall be a condition precedent to an appeal to the Owner, or the right of the Contractor to receive, demand, or claim any money or other compensation under this contract and a condition precedent to any liability on the part of the Owner to the Contractor on account of this contract. Whenever the Engineer shall be unable to act, in consequence of absence or any other cause, then such engineer as the Engineer or the Owner shall designate shall perform any and all of the duties and be vested with any or all of the powers herein given to the Engineer.

4. Inspection

The Engineer and their representatives shall at all times have access to the work whenever it is in preparation or progress, and the Contractor shall provide proper facilities for such access and for observation.

If the Contract Specifications or other Contract Documents, the Engineer's instruction, laws, ordinances, or any public authority require any work to be specially tested or approved, the Contractor shall give the Engineer timely notice of its readiness for observation and if the observation is by another authority than the Engineer, of the date fixed for such observation.

If any work shall be covered up without approval or consent of the Engineer, it must if required by the Engineer be uncovered for examination and properly restored at the Contractor's expense.

Re-examination of any work may be ordered by the Engineer, and, if so ordered, the work must be uncovered by the Contractor. If such work is found to be in accordance with the Contract Documents, the Owner will pay the cost of re-examination and replacement. If such work is not in accordance with the Contract Documents, the Contractor shall pay such cost.

Properly authorized inspectors shall be considered to be the representatives of the Owner limited to the duties and power entrusted to them. It will be their duty to inspect materials and workmanship of those portions of the work to which they are assigned, either individually or collectively, under the instructions of the Engineer and to report any and all deviations from the Contract Drawings, Contract Specifications, and other Contract provisions which may come to their notice. Any inspector shall have the right to order the work to which he is assigned stopped, if in their judgment such action is necessary to (a) allow proper inspection, (b) avoid irreparable damage to the work or (c) avoid subsequent condemnation of work which could not be readily replaced or restored to an acceptable condition.

GENERAL CONDITIONS OF CITY CONTRACTS

Such stoppage shall be for a period reasonably necessary for notification of the Engineer and for the Engineer to determine that the work will in fact proceed in due fulfillment of all contract requirements.

5. Retention of Imperfect Work

If any portion of the work done or material furnished under this Contract shall prove defective and not in accordance with the Contract Documents, and if the imperfection in the same shall not be of sufficient magnitude or importance to make the work impracticable or will create conditions which are dangerous or undesirable, the Engineer shall have the right and authority to retain such work instead of requiring the imperfect work to be removed and reconstructed but he shall recommend to the Owner such deductions therefore in the payments due the Contractor as may be just and reasonable, and Owner may make such deductions as are reasonable.

6. Changes in Work

The Engineer shall have the right, in writing, to order additions to, omissions from, or corrections, alterations and modifications in the line, grade, form, dimensions, plan or kind or amount of work or materials herein contemplated, or any part thereof, either before or after the beginning of construction. Changes involving an increase or decrease in the cost of the work or inconsistent with the Contract Drawings or the Contract Specifications shall be approved in accordance with the paragraph "Alterations, Omissions and Extra Work" of these General Conditions, and then such order will be binding upon the Contractor.

Such alterations shall in no way affect, vitiate, or make void this contract or any part thereof, except that which is necessarily affected by such alterations and is clearly the evident intention of the parties to this contract.

In case of neglect or refusal by the Contractor to perform any extra work which may be authorized by the Owner or to make satisfactory progress in the execution of the same, the Owner may employ any person or persons to perform such work and the Contractor shall not in any way interfere with or molest the person or persons so employed.

7. Additional Drawings by Owner

The Contract Drawings made a part of this contract at the time of its execution are intended to be comprehensive and to indicate in more or less detail the scope of the work. In addition to these drawings, however, the Engineer may furnish such additional drawings from time to time during the progress of the work as are necessary to make clear or to define in greater detail the intent of the Contract Specifications and Contract Drawings, and the Contractor shall make their work conform to all such drawings.

8. Emergency Protection

In case of an emergency which threatens loss, damage or injury to persons or property and which requires immediate action to remedy, then and in that event, the Engineer, with or without notice to the Contractor may provide suitable protection to the said property and persons by causing such work to be done and such material to be furnished as shall provide such protection as the Engineer may consider necessary and adequate.

The cost and expense of such work and material so furnished shall be borne by the Contractor and if the same shall not be paid on presentation of the bills therefore, then such costs shall be deducted from any amounts due or to become due the Contractor.

The performance of such emergency work under the direction of the Engineer shall in no way relieve the Contractor from any damages which may occur during or after such precaution has been taken by the Engineer.

9. Suspension of Work

The Owner may at any time suspend the work, or any part thereof by giving reasonable notice to the Contractor. The work shall resume by the Contractor on the date fixed in a written notice from the Owner to the Contractor to do so. If such stoppage is due to no fault of the Contractor and not otherwise authorized by other provisions of the Contract Documents, the Owner shall reimburse the Contractor for such expense, if any, which is incurred by the Contractor, in connection with the work under this contract as a result of such suspension, which would not have

GENERAL CONDITIONS OF CITY CONTRACTS

been incurred or reasonably required if there had not been such suspension, provided that there shall be no reimbursement if the period of suspension occurs after expiration of the time allowed for completion of the work, exclusive of any extension of time.

10. Right of Owner to Terminate Contract

In the event that any of the provisions of this contract are violated by the Contractor or by any of their subcontractors, the Owner may serve written notice upon the Contractor and the Surety of its intention to terminate this contract, such notice to contain the reasons for such intention to terminate this contract, and, unless within ten (10) days after the serving of such notice upon the Contractor, such violation shall cease or satisfactory arrangement for correction be made in writing, the contract shall upon the expiration of said ten days, cease and terminate. In the event of any such termination, the Owner shall immediately serve notice thereof upon the Surety and the Contractor, and the Surety shall have the right to perform the contract. If the Surety does not commence performance thereof within thirty (30) days from the date of the mailing to such Surety of said notice of termination, the Owner may take over the work and prosecute the same to completion by contract or force account at the expense of the Contractor, and their Surety shall be liable to the Owner for any excess cost to the Owner.

11. Termination of Agreement

This agreement may be terminated for reasons of convenience or default.

- a) Termination for Convenience: The City of Battle Creek may terminate this Agreement, in whole or in part, at any time by written notice to the Contractor. The Contractor shall be paid its costs, including Contract closeout costs and profit on work performed up to the time of termination. The Contractor shall promptly submit its termination claim to be paid the Contractor. If the Contractor has any property in its possession belonging to or paid for by the City of Battle Creek, the Contractor will account for same, and dispose of it in the manner the City of Battle Creek directs.
- b) Termination For Default: If the Contractor does not deliver the complete Project in accordance with this Agreement or if the Contractor fails to comply with any other provisions of the Agreement, The City of Battle Creek may terminate, revoke or rescind this Agreement for default. Termination, revocation or rescission shall be effected by serving notice on the Contractor setting forth the manner in which the Contractor is in default. The Contractor will only be paid the Contract price for the portions of the Project furnished, accepted, and found in compliance with the terms and conditions of this Agreement.

If it is later determined by the City of Battle Creek that the Contractor has an excusable reason for not performing, such as a strike, fire or flood, events which are not the fault of, or are beyond the control of the Contractor. The City of Battle Creek, after setting up a new delivery or performance schedule, may allow the Contractor to continue work, or treat the termination as a termination for convenience.

Termination, revocation or recession of this Agreement for default shall not affect or impair any rights or claims of the City of Battle Creek to damages for breach of any covenants of this Agreement by the Contractor. Further, should the Contractor fail to comply with the conditions of the Agreement or fail to complete the specified work or furnish the specified services as stipulated in the Agreement, the City of Battle Creek reserves the right to purchase on the open market, or to complete the required work at the expense of the Contractor and to pursue all other recoveries available to the City of Battle Creek under Michigan law.

In the event of a dispute under this Agreement, the City if Battle Creek and the Contractor agree that proper venue for purposes of litigations shall be Calhoun County, Michigan.

12. Placing Portions of Work in Service

If desired by the Owner, portions of the work, as completed, may be placed in service, and the Contractor shall give proper access to the work for this purpose, but such use and operation shall not constitute an acceptance of the work, and the Contractor shall be liable for defects due to faulty construction until one year after the entire work under this contract is finally accepted.

GENERAL CONDITIONS OF CITY CONTRACTS

13. Sequence and Progress of Work

The Engineer shall have the power to direct the order and sequence of the work, which in general shall be to coordinate the construction of several parts of the contract to a successful completion as rapidly as possible. If at any time before the commencement or during the progress of the work the materials and procedures used or to be used appear to the Engineer as insufficient or improper for securing the quality of work required, or the required rate of progress, he may order the Contractor to increase efficiency or to improve their character and the Contractor shall conform to such order, but failure of the Engineer to demand any increase of such efficiency or any improvement shall not release the Contractor from their obligations to secure the quality of work or the rate of progress specified.

V. WORKMANSHIP, MATERIALS AND EQUIPMENT

1. Workmanship

All workmanship shall be first-class, performed by persons skilled in the applicable trades, and shall be subject to the inspection, approval, or rejection of the Engineer in accordance with the requirements and intent of the Contract Documents. The Engineer shall have the right to order the Contractor to correct or replace unacceptable workmanship. Any other portions of the work disturbed or damaged by such correction or replacement shall be made good at the Contractor's expense.

2. Interpretation of Specifications and Drawings

The Contract Specifications and the Contract Drawings are intended to be explanatory of each other. Any work indicated on the Contract Drawings and not in the Contract Specifications, or vice versa, is to be executed as if indicated in both. All work shown on the Contract Drawings, the dimensions of which are not figured, shall be accurately followed to the scale to which the drawings are made, but figured dimensions are in all cases to be followed, where given, though they differ from scaled measurements. Large scale drawings shall be followed in preference to small scale drawings. Should it appear that the work to be done, or any of the matters relative thereto, is not sufficiently detailed or explained in these Contract Documents, including the Contract Drawings, the Contractor shall apply to the Engineer for such further explanations as may be necessary and shall conform thereto as part of this contract, so far as may be consistent with the terms of this contract. In the event of any doubt or question arising respecting the true meaning of the Contract Specifications, reference shall be made to the Engineer and their decision thereon shall be final.

3. General Quality of Materials

Materials and equipment shall be new and of a quality equal to that specified or approved. Mechanical and electrical equipment shall be the products or manufactures of established good reputations regularly engaged in the fabrication of such equipment. Unless otherwise noted, any equipment offered shall be current modifications which have been in successful regular operation under comparable conditions for a period of at least two years. This time requirement, however, does not apply to minor details nor to thoroughly demonstrated improvements in design or in material of construction. Work shall be done and completed in a thorough and workmanlike manner.

4. Quality in Absence of Detailed Specifications

Whenever under this contract it is provided that the Contractor shall furnish materials or manufactured articles or shall do work for which no detailed specifications are set forth, the materials or manufactured articles shall be of the best grade in quality and workmanship obtainable in the market from firms of established good reputation, or, if not ordinarily carried in stock, shall conform to the usual standards for first-class materials or articles of the kind required, with due consideration of the use to which they are to be put. In general, the work performed shall be in full conformity and harmony with the intent to secure the best standard of construction and equipment of the work as a whole or in part.

5. Materials and Equipment Specified by Name

Except as hereinafter otherwise provided, whenever any material or equipment is indicated or specified by patent or proprietary name or by the name of the manufacturer, such specification shall be considered as used for the

GENERAL CONDITIONS OF CITY CONTRACTS

purpose of describing the material or equipment desired and shall be considered as followed by the words "or approved equal", and the Contractor may offer any material or equipment which shall be approved by the Engineer and be equal in every respect to that specified; provided, however, that written approval is obtained from the Engineer prior to incorporation into the work.

6. Approval of Materials and Equipment

All materials and equipment offered to be furnished or furnished for the work are subject to inspection and approval or rejection by the Engineer. Insofar as practicable, approval shall be obtained prior to purchase and delivery of materials and equipment to the site of the work.

7. Drawings of Equipment and Fabricated Materials

As soon as possible after execution of the contract, the Contractor shall submit to the Engineer a complete listing of the manufacturers of each item of equipment or assembly fabricated off the site which he proposes to furnish on the project, together with sufficient information, including shop assembly and detail drawings, manufacturers' specifications, and performance data to demonstrate clearly that the materials and equipment to be furnished comply with the provisions and intent of the Contract Specifications, Contract Drawings and Contract Documents. If the information shows any deviation from the contract requirements, the Contractor shall, by a statement in writing accompanying the submittal, advise the Engineer of the deviation and state the reason therefore.

The Contractor shall also submit to the Engineer shop drawings showing details of structural steel and concrete reinforcing steel, bending details, piping details, and of other items necessary to proper installation of materials into the completed work.

All drawings and details described above when submitted shall bear the stamp of the Contractor and initials of their authorized representative indicating that the Contractor has reviewed and approved such drawings as meeting their interpretation of the requirements of the contract.

The submittal shall be made in triplicate plus the number of copies that the Contractor desires to be returned to him. Upon review, the Engineer will return all but three copies, which will be stamped or marked either no exception taken or make corrections as noted. In the latter case, an explanation will be given of why the material or equipment is unsatisfactory.

The Contractor shall make any indicated corrections on the drawings returned and shall resubmit corrected drawings until final approval is obtained.

The absence of any exceptions taken by the Engineer of shop drawings and other data submitted by the Contractor shall not relieve the Contractor from responsibility for any errors therein or of furnishing the materials and equipment of proper dimensions, size, quantity, quality, and all performance characteristics to meet the requirements and intent of the Contract Documents.

The Contractor shall have no claim for damages or extension of time on account of any delay in the work resulting from the rejection of material or from revision and resubmission of drawings and other data for approval.

8. Equipment Drawings

The Contract Drawings detail structures, piping, appurtenances, and indicate equipment to accomplish certain results. If a contract is entered into which includes items of equipment, facilities, or processes requiring any modifications or deviations from the Contract Drawings, the Contractor shall prepare and submit to the Engineer detailed drawings showing all modifications in structures, reinforcing steel, piping, electrical and mechanical work, etc., to adapt the Contract Drawings to the alternate equipment or facilities. The Engineer will review such drawings and either take no exceptions with them or indicate thereon changes necessary to comply with the project requirements. The Contractor shall revise any unapproved drawings and resubmit them to the Engineer.

GENERAL CONDITIONS OF CITY CONTRACTS

9. Samples

Whenever requested by the Engineer or called for by the Contract Drawings or the Contract Specifications or Contract Documents, sample or test specimens of the materials to be used or offered for use in the work shall be obtained or prepared by the Engineer. The material for the samples shall be provided by the Contractor with the cost of such materials being merged in the prices stated on items which make up the Total Base Bid.

10. Tests

All tests and retests of equipment, piping and structures called for in the Contract Specifications or the Contract Drawings or Contract Documents or required by laws, ordinances, and regulations shall be provided by the Owner. Material for testing shall be provided by the Contractor, with the cost of such materials being merged in the prices stated on items which make up the Total Base Bid. All laboratory tests required shall be made by a testing laboratory employed by the Owner. All tests shall be made in accordance with specified procedures, or if not herein specified, they shall be made in accordance with applicable recognized standard practice. Laboratory tests shall be made by a recognized laboratory. Reports of tests provided by the Engineer shall be promptly submitted to the Contractor.

Tests of manufactured materials by the manufacturer at the point of manufacture, assembly and/or fabrication may be accepted by the Engineer in lieu of tests by an independent laboratory.

The Contractor shall give the Engineer sufficient notice of the time and place of any test to be made at the point of manufacture, assembly or fabrication in order that the Engineer may witness the test if he so desires.

11. Material Tests

Materials incorporated in this contract shall be subject to inspection and tests as follows. All tests, except as noted, shall be made by an independent established testing laboratory, employed and paid for by the Owner. Samples at the mill or factory shall be taken by a representative of the testing laboratory. Samples of construction materials from the site of the work, such as sand, gravel, concrete, cylinders, pipe, etc., for which laboratory tests are required, shall be taken, assembled or prepared on the site of the work by representatives of the testing laboratory or by the Engineer. Any necessary containers, shipping boxes or crates shall be supplied by the testing laboratory or the Engineer. The testing laboratory or the Engineer shall pay all costs of transporting samples to the laboratory. The Contractor shall furnish, without additional charge, all material that may reasonably be required for testing purposes. Visual tests of all materials and slump tests of concrete as specified in the Contract Specifications will be made by the Engineer without cost to the Contractor.

Payment for tests shall be made by the Owner. The tests to be made, the number of samples, and acceptance and rejection shall be based on the latest revised issue of standards and tentative standards of the American Society for Testing Materials unless otherwise noted in the Contract Specifications. Two signed copies of the test reports on testing laboratory forms or letterhead shall be delivered to the Contractor as soon as available.

All tests shall be made in accordance with procedures specified in the Contract Specifications, or if not herein specified, they shall be made in accordance with applicable recognized standard practice. Reports of tests provided by the Engineer shall be promptly submitted to the Contractor.

Tests of manufactured materials by the manufacturer at the point of manufacture, assembly and/or fabrication may be accepted by the Engineer in lieu of tests by an independent laboratory.

The Contractor shall give the Engineer sufficient notice of the time and place of any test to be made at the point of manufacture, assembly or fabrication in order that the Engineer may witness the test if he so desires.

12. Storage of Materials

Materials shall be so stored as to ensure the preservation of their quality and fitness for the work. They shall be so located and disposed that prompt and proper inspection thereof may be made.

GENERAL CONDITIONS OF CITY CONTRACTS

13. Operating and Maintenance Instructions

Before final acceptance of the work, the Contractor shall deliver to the Engineer a minimum of two complete and suitable operating and maintenance instructions and parts lists for each piece of equipment or equipment assembly. These instructions and lists shall be assembled in two or more sets in an orderly arrangement and shall be accompanied by a tabulation of the information provided for each item of equipment.

14. Compliance with State Safety Code

All necessary machinery guards, railings and other protective devices shall be provided as specified by the State Division of Industrial Safety of the State in which the work under this contract is constructed.

15. Fuel Storage

1. On-site storage of any fuel (gasoline, diesel, etc.), shall be prohibited except that contained in the fuel tanks of the contractor's equipment; and, or,
2. The contractor shall defend, hold harmless and indemnify the City against all damages resulting from pollution damage caused by their equipment and/or supplies, regardless of the cause.

VI. PROSECUTION OF WORK

1. Equipment and Methods

The work under this contract shall be prosecuted with all materials, tools, machinery, apparatus and labor, and by such methods as are necessary to the complete execution of everything described, shown or reasonably implied in the Contract Documents. If at any time before the beginning or during the progress of the work, any part of the Contractor's plant or equipment or any of their methods of execution of the work appear to the Engineer to be unsafe, inefficient or inadequate to insure the required quality or rate of progress of the work, he may order the Contractor to increase or improve their facilities or methods and the Contractor shall comply promptly with such orders; but neither compliance with such orders nor failure of the Engineer to issue such orders shall relieve the Contractor from their obligation to secure the degree of safety, the quality of the work and the rate of progress required. The Contractor alone shall be responsible for the safety, adequacy and efficiency of their plant, equipment and methods.

2. Time of Completion

The Contractor shall promptly begin the work under this contract, and all portions of the project made the subject of this contract shall be begun and so prosecuted that they shall be completed and ready for full use within the time specified elsewhere in these Contract Documents.

3. Avoidable Delays

Avoidable delays in the prosecution or completion of the work shall include all delays which might have been avoided by the exercise of care, prudence, foresight or diligence on the part of the Contractor.

Delays in the prosecution of parts of the work, which may in themselves be unavoidable but do not necessarily prevent or delay the prosecution of other parts of the work nor the completion of the whole work within the time herein specified, reasonable loss of time resulting from the necessity of submitting plans to the Engineer for approval and from the making of surveys, measurements and inspections, and such interruptions as may occur in the prosecution of the work on account of the reasonable interference of other contractors employed by the Owner, which do not necessarily prevent the completion of the whole work within the time herein specified, will be deemed avoidable delays within the meaning of this contract.

GENERAL CONDITIONS OF CITY CONTRACTS

4. Unavoidable Delays

Unavoidable delays in the prosecution or completion of the work under this contract shall include all delays which may result through causes beyond the control of the Contractor and which he could not have provided against by the exercise of care, prudence, foresight or diligence. Orders issued by the Owner, changing the amount of work to be done, the quantity of material to be furnished, or the manner to be done, the quantity of material to be furnished, or the manner in which the work is to be prosecuted, failure of the Owner to provide rights-of-way, and unforeseen delays in the completion of the work of other contractors under contract with the Owner will be considered unavoidable delays, so far as they necessarily interfere with the Contractor's completion of the whole of the work. Delays due to adverse weather conditions will not be regarded as unavoidable delays as the Contractor should understand that such conditions are to be expected and plan their work accordingly.

5. Notice of Delays

Whenever the Contractor foresees any delay in the prosecution of the work, and in any event immediately upon the occurrence of any delay, he shall notify the Engineer in writing of the probability of the occurrence of such delay and its cause in order that the Engineer may take immediate steps to prevent, if possible, the occurrence or continuance of the delay, or, if this cannot be done, may determine whether the delay is to be considered avoidable or unavoidable, how long it continues, and to what extent the prosecution and completion of the work are to be delayed thereby.

After the completion of any part of the whole of the work, the Engineer, in approving the amount due to the Contractor, will assume that any and all delays which have occurred in its prosecution and completion have been avoidable delays, except such delays as shall have been called to the attention of the Engineer at the time of their occurrence and later found by him to have been unavoidable. The Contractor will make no claims that any delay not called to the attention of the Engineer at the time of its occurrence has been an unavoidable delay.

6. Extension of Time

(a) Unavoidable Delays

For delays which are unavoidable, as determined by the Owner, the Contractor will be allowed, if he applies for the same, an extension of time beyond the time specified for completion elsewhere in the Contract Documents, proportionate to such unavoidable delay or delays, within which to complete the Contract; and the Contractor will not be charged, because of any extension of time for such unavoidable delay, any liquidated damages or engineering and inspection costs as are charged in the case of extensions of time for avoidable delays.

(b) Avoidable Delay

If the work called for under this Contract is not finished and completed by the Contractor, in all parts and in accordance with all requirements, within the time specified for completion elsewhere in these Contract Documents, including extensions of time granted because of unavoidable delay, or if any time prior to the expiration of said time it should appear to Owner that the Contractor will be unable to finish and complete said work as aforesaid within said time, and if the Contractor's failure or inability to finish and complete said work as aforesaid within said time should be due, as determined by Owner, to avoidable delay or delays, then in that event the Owner, if it finds such to be for the best interests of the Owner, may, but will not be required to grant to Contractor an extension or extensions of time within which to finish and complete all said work.

If such extension of time for Avoidable Delay is not granted, the provisions of the paragraph "Right of Owner to Terminate Contract" of these General Conditions will be followed. If the time limit be so extended, the Owner shall charge to Contractor, and may deduct from the final payment for the work, all engineering, and inspection expenses incurred by Owner in connection with the work during the period of such extension or extensions, except that the cost of final surveys and preparation of final estimates will not be included in such charges. Such expenses of Owner will be computed on the basis of the per diem schedule of charges set forth in the General Conditions of Contract. In addition, if such an extension of time is granted, Contractor will be charged liquidated damages if provided for in the Special Conditions of Contract.

GENERAL CONDITIONS OF CITY CONTRACTS

7. Unfavorable Weather and Other Conditions

During unfavorable weather and other unfavorable conditions, the Contractor shall pursue only such portions of the work as shall not be damaged thereby. No portions of the work whose satisfactory quality or efficiency will be affected by an unfavorable condition shall be constructed while these unfavorable conditions exist unless, by special means or precautions approved by the Engineer, the Contractor shall be able to overcome them.

VII. PAYMENTS AND CONTRACT COMPLETION

1. Progress Estimates and Payments

At about the close of each month during which satisfactory progress has been made toward the final completion of the work the Engineer will make an estimate of the amount and value of the work which has been done under this Contract during that month, or since the date of the next preceding estimate. Such estimate shall not be made either wholly or in part of appraisal or estimation, and it shall be sufficient if it is approximate only. Any error or inaccuracy which may occur in any such progress estimate may be allowed for or corrected in any subsequent estimate.

The first estimate shall be of the value of the work done since the Contractor shall have begun the performance of this contract, and every subsequent estimate, except the final estimate shall be of the value of the work done since the last preceding estimate was made; provided, however, that should the Contractor fail to adhere to the program of completion fixed in this contract, the Engineer shall deduct from the next and all subsequent estimates the full calculated accruing amount of the liquidated damages (if any) to the date of said estimate, until such time as the compliance with the program has been restored; and provided, further that no estimate shall be required to be made when, in the judgment of the Engineer, the total value of the work done and materials incorporated into the work under the contract since the last preceding estimate amounts to less than Five Thousand Dollars (\$5,000.00).

The estimate shall be signed by the Contractor and Engineer and approved by the Owner, and after such approval the Owner, subject to the foregoing provisions, and partial waiver of liens, will pay or cause to be paid to the Contractor, in the manner provided by law, an amount equal to ninety-five percent (95%) of the estimated value of the work performed.

2. Alterations, Omissions and Extra Work

Owner reserves the right to increase or decrease the quantity of any item or portion of the work, or to omit portions of the work, as may be deemed necessary or advisable by the Owner, and, also, to make such alterations or deviations, additions to, or omissions from the work or the Contract Drawings and Specifications, as may be determined during the progress of the work to be necessary or advisable for the proper completion thereof. Upon written order of the Owner, the Contractor shall proceed with the work as increased, decreased or altered.

The Engineer is authorized to order minor changes in the work which do not involve extra cost to Owner, and which do not change the character of the work; he is not authorized to order any other changes, alterations, omissions, additions, or extra work, unless the same are approved in a Contract Supplement properly authorized in writing by the governing unit of the Owner. No claim of Contractor for extra compensation because of any change, alteration, omission, addition or extra work will be paid or be payable unless a written order for such change, alteration, omission, addition or extra work, is signed by the authorized representative of the Owner.

When any changes decrease the amount of work to be done, such changes shall not constitute a basis or reason for any claim by Contractor for extra compensation or damages on account of any anticipated profits which he thereby loses on the omitted work; and Contractor shall not be entitled to any compensation or damages therefore.

3. Owner's Right to Withhold Certain Amounts

The Owner may withhold from payments to the Contractor, in addition to retained percentage, such an amount or amounts as may be necessary to cover:

GENERAL CONDITIONS OF CITY CONTRACTS

- (a) Payments that may be earned or due for just claims for labor or materials furnished in and about the work;
- (b) Defective work not remedied;
- (c) Failure of the Contractor to make proper payments to a subcontractor;
- (d) Reasonable doubt that this contract can be completed for the balance then unpaid;
- (e) Damage caused by the contractor has not been repaired;
- (f) Cost of field engineering, inspection and other expenses mentioned in paragraph VII 6, "Excess Cost of Field Engineering and Inspection for Time Extension".

The Owner will disburse and shall have the right to act as agent for the Contractor in disbursing such funds as have been withheld pursuant to this paragraph to the party or parties who are entitled to payment therefrom. The Owner will render to the Contractor a proper accounting of all such funds disbursed in behalf of the Contractor.

The Owner also reserves the right, even after full completion and acceptance of the work, to refuse payment of the final ten percent (10%) due the Contractor until it is satisfied that all subcontractors, material suppliers, and employees of the Contractor have been paid in full.

4. Compensation for Extra Work and Work Omitted

Whenever corrections, additions or modifications in the work under this Contract change the amount of work to be done or the amount of compensation due the Contractor, the Owner will prepare a Contract Supplement setting forth the extra work to be performed or work to be omitted. Such a Contract Supplement will also set forth the method of computing the added or reduced compensation to be due the Contractor. The method of computing the added or reduced compensation will be determined under one or more of the following methods as selected by the Owner.

- (a) By unit prices contained the Contractor's original Proposal and incorporated in this construction contract.
- (b) By a supplemental schedule of prices contained in the Contractor's original Proposal and incorporated in this construction contract.
- (c) By an acceptable lump sum or unit price proposal by the Contractor.
- (d) By an amount equal to the sum of the following five items as full and proper compensation:
 - (1) The necessary reasonable cost to the Contractor of the material required for the work as furnished by the Contractor and delivered by him at the site of the work.
 - (2) The necessary cost to the Contractor of the labor (including foremen devoting their exclusive attention to the work in question) required to incorporate all of said material into the work and to finish the work in accordance with direction.
 - (3) The necessary reasonable cost to the Contractor for the use of equipment used for the work.
 - (4) The cost of workers' compensation insurance premiums, State unemployment and Federal Social Security payments on the labor included in item (2).
 - (5) Fifteen percent (15%) of the sum of items (1), (2), (3) and (4) which shall be considered as covering all other expenses and profit.

Under method (d) described above, in order that a proper estimate may be made by the Engineer of the cost of labor and materials incorporated into extra work, the Contractor shall furnish weekly an itemized statement of material and labor supplied, together with the cost of such material and the wages paid, and shall furnish vouchers

GENERAL CONDITIONS OF CITY CONTRACTS

for quantities and prices of such labor, material or work. In the event the Contractor fails to comply with the above provisions, he shall have no claim for compensation against the Owner.

In cases where a lump sum proposal is submitted by the Contractor in excess of Five Hundred Dollars (\$500.00) and the Owner considers the proposal so submitted is excessive or unreasonable for the changes or added work contemplated, the Owner reserves the right to request a proposal for the same changed items from other contractors. If a proposal for such added work is obtained from other contractors at a lesser amount, the Owner reserves the right to make an award of such work to another contractor unless the Contractor on this Contract agrees to do the added work or changed work for the price named by the other contractor.

5. Time for Completion of Contract

All work called for by this contract shall be completed and ready for full use within the time specified in the signed Agreement.

6. Excess Cost of Field Engineering and Inspection for Time Extension

This Contract provides for the payment by Contractor to the Owner of certain engineering, and inspection expenses in the event Owner should grant to Contractor an extension or extensions of time because of avoidable delay. The amount of said engineering, and inspection expenses, reimbursement of which is provided for in said paragraph, shall be computed and determined on the basis of the per hour schedule of charges for a forty-hour straight time work week as shown in Column 1 of the following schedule.

For any overtime beyond the regular 8-hour day and for any time worked on Saturday, Sunday or Holidays, the charges for such personnel will be as shown in Column 2 of the following schedule.

Column 1	Column 2 (each hour)
Engineer \$40.00	\$60.00
Inspector 30.00	45.00

7. Acceptance of Work

The work will be accepted in writing by the Owner when the whole shall have been completed in accordance with the terms of the Contract Documents as determined by the Owner, and its official representatives. When the work is substantially completed, the Contractor shall notify the Owner, in writing, that the work will be ready for final inspection and test on a definite date which shall be stated in such notice. The notice shall be given at least five (5) days in advance of said date and shall be forwarded through the Engineer. The Owner shall cause an inspection to be made in order to determine whether the work has been completed in accordance with the terms of the/she Contract Documents.

8. Final Estimate, Final Contract Supplement & Payment

The Engineer shall, as soon as practicable after the final acceptance of the work under this contract, make a final estimate of the amount of work done there under and the value thereof.

A final Contract Supplement shall be prepared which will indicate the as-built quantities for all work completed and approved by the Engineer. After the approval of the final Contract Supplement by the governing body of the Owner, the Engineer will prepare the final estimate for which the Owner shall pay or cause to be paid to the Contractor, in the manner provided by law, the entire sum so found to be due hereunder, after deducting there from all previous payments and such other lawful amounts as the terms of the contract prescribe.

Neither the final payment nor any part of the retained percentage shall become due until the Contractor shall deliver to the Owner a complete release of all claims or liens arising out of the contract, or receipts in full in lieu thereof and, if required in either case, an affidavit that so far as he has knowledge or information

GENERAL CONDITIONS OF CITY CONTRACTS

the release and receipts include all the labor and materials for which a lien or claim could be filed; but the Contractor may, if a subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Owner to indemnify the Owner against any claim or lien (in cases where such payment is not already guaranteed by surety bond). If any claim or lien remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging such a lien, including all costs and a reasonable attorney's fee.

In no case will final payment be made in less than thirty-five (35) calendar days after the completion of the work and its acceptance by the Owner.

SECTION III - REQUIREMENTS FOR FEDERAL PROJECTS

TABLE OF CONTENTS

1.	WORK HOURS	38
2.	RETENTION OF RECORDS.....	38
3.	RIGHTS TO DATA	38
4.	INVENTIONS.....	39
5.	SUB CONTRACTOR REQUIREMENTS.....	39
6.	CLEAR AIR/CLEAN WATER REQUIREMENTS	40
7.	ENERGY CONSERVATION	40
8.	PATENT	40
9.	GOVERNMENT AUDIT	40
10.	COPYRIGHTS.....	40
11.	INSPECTION BY FEDERAL OFFICIALS	40
12.	RESTRICTIONS ON LOBBYING.....	41
13.	FEDERAL LAWS AND REGULATIONS	41
14.	PAYMENT OF PREVAILING WAGES & FRINGE BENEFITS FOR FEDERALLY FUNDED PROJECTS	41
15.	DEBARMENT & SUSPENSION.....	41
16.	DRUG-FREE WORKPLACE REQUIREMENTS	41
17.	CDBG AND HOME (ONLY) PROJECT -SECTION 3 CLAUSE	42
	CERTIFICATION REGARDING LOBBYING	43
	CERTIFICATION OF PRIMARY CONTRACTOR REGARDING DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS.....	44
	CERTIFICATION OF LOWER TIER PARTICIPANTS (SUBCONTRACTORS)	45

FEDERAL GUIDELINES

1. WORK HOURS

Contractor must comply with Sections 103 and 107 of the Contract Work Hours and Safety Standards Act (40 U.S.S. 327-330) as supplemented by Department of Labor regulations (29 CFR Part 5).

2. RETENTION OF RECORDS

The Contractor shall permit the City or its authorized representative to inspect and audit all data and records relating to the performance of this Project for a period of three (3) years after final payment is made to the Contractor. For such inspection and audit, the Contractor shall retain all data records pertaining to this Project. The periods of access and examination for data and records which relate to litigation of the settlement of claims arising out of the performance of this Contract, or costs and expenses of this Contract as to Which exception has been taken by the City or its authorized representatives, shall continue until such litigation, claims or exceptions have been disposed of.

3. RIGHTS TO DATA

The Contractor agrees to comply with the following provisions:

- (a) The term "subject data" as used herein means recorded information, whether or not copyrighted, that is delivered to specified to be delivered under this Agreement. The term includes graphic or pictorial delineation in media such as drawings or photographs; text inspections or related performance or design-type documents; machine forms such as punched cards, magnetic tape or computer memory printouts; and information retained in computer software, engineering drawings and associated lists specifications, standards, process sheets, manuals, technical reports, catalog item identifications, and related information. The term does not include financial reports, cost analyses, and similar information incidental to Project administration.
- (b) The following restrictions apply to all subject data first produced in the performance of this Agreement:
 - (1) Except for its own internal use, the City may not publish or reproduce such data in whole or in part, or in any manner or form, nor may the City authorize others to do so, without the written consent of the Government, until such time as the Government may have either released or approved the release of such data to the public; this restriction on publication, however, does not apply to Agreements with academic institutions.
 - (2) As authorized by 49 CFR Part 18.34, the city reserves a royalty-free, nonexclusive and irrevocable license to reproduce, publish or otherwise use, and to authorize others to use, for Federal Government purposes
- a) Any work developed under a grant, cooperative agreement, sub-grant, sub-agreement, or third party contract, irrespective of whether or not a copyright has been obtained; and
- b) Any rights of copyright to which the City of Battle Creek or a third party contractor purchases ownership with Federal assistance.
- c) The City of Battle Creek shall indemnify, save and hold harmless the Government, its officers, agents, and employees acting within the scope of their official duties against any liability, including costs and expenses, resulting from any willful or incidental violation by the City of Battle Creek of proprietary rights, copyrights, or right of privacy, arising out of the publication, translation, reproduction, delivery, use or disposition of any data furnished under this Agreement.
- d) Nothing contained in this clause shall imply a license to the Government under any patent or be construed as affecting the scope of any license or other right otherwise granted to the Government under any patent.

FEDERAL GUIDELINES

- e) Provisions (2)b), (2)c), and (2)d) of this Agreement are not applicable to material furnished to the City of Battle Creek by the Government and incorporated in the work furnished under the Agreement; provided that such incorporated material is identified by the City of Battle Creek at the time of delivery of such work.
- f) In the event that the Project, which is the subject of this Agreement, is not completed, for any reason whatsoever, all data developed under that Project shall be come subject data as defined in Provision (2) a) of this Agreement and shall be delivered as the Government may direct.

4. INVENTIONS

If any invention, improvement, or discovery of the Contractor is conceived or first actually reduced to practice in the course of or under this Project, which invention, improvement, or discovery may be patentable under the laws of the United States of America or any foreign country, the Contractor shall immediately notify the City of Battle Creek and provided a detailed report. The rights and responsibilities of the City of Battle Creek, the Contractor, and the Federal government with respect to such invention, improvement, or discovery will be determined in accordance with applicable Federal laws, regulations, policies, and any waiver thereof.

5. SUB CONTRACTOR REQUIREMENTS

- A. The Contractor shall solicit minority and women-owned businesses whenever possible as referenced in 570.507 HUD requirements as sources of supplies, equipment, construction and services as sub-contractors in this procurement by :
- B. Assuring State of Michigan qualified minority and women-owned businesses are solicited. The City of Battle Creek may require proof of solicitation.
 - a) When economically feasible, dividing total requirements into smaller tasks or quantities so as to permit maximum minority and women-owned business participation.
 - b))Where the requirements permits, establishing delivery schedules which will encourage participation of minority and women-owned businesses.
 - c) Using the service and assistance of the Small Business Administration, the Office of Disadvantaged Business Enterprise of the Department of Commerce or other appropriate agency as required.
- C. The low responsive, responsible bidder shall submit a list of their sub-contractor's before award of the contract. They must list all subcontractors to be associated with their bid, including the type of work to be performed. Any and all subcontractors shall be bound by all of the terms, conditions and requirements of the bid/contract; however, the prime contractor shall be responsible for the performance of the total work requirements.
- D. The Contractor shall cooperate with the City of Battle Creek in meeting its commitments and goals with regard to maximum utilization of minority and women business enterprise, and will use its best efforts to ensure that minority and women business enterprises have maximum practical opportunity to complete for subcontract work under this agreement.
- E. **DEFINITIONS**

Minority Business Enterprises: A minority business enterprise is defined as a company wherein minorities constitute active participation and ownership over 50%. Minorities are defined as United States citizens who are members of the following groups of protected classes: Black, Hispanic, Oriental, Eskimo and American Indians who are certified by the Indian Affairs Commission. These groups will have the power to make policy decisions in a business and are involved in the day-to-day management of the business.

FEDERAL GUIDELINES

Women Business Enterprise: A women business enterprise is defined as a company wherein females constitute active participation and ownership of over 50%. The female owner will have the power to make policy decisions in a business and are involved in the day-to-day management of the business.

6. CLEAR AIR/CLEAN WATER REQUIREMENTS

The contractor must comply with all applicable standards, orders, or requirements issued under section 306 of the Clear Air Act (42 U.S.C., 1857(h), section 508 of the Clean Water Act (33 U.S.C. 1368), Executive Order 11738, and E.P.A. regulations (40 CFR Part 15) for all contracts in excess of \$100,000.

7. ENERGY CONSERVATION

The Contractor shall familiarize themselves and abide by the mandatory standards and policies relating to energy efficiency which are contained in the Energy Policy and Conservation Act (Public Law 94-163) and all State policies on energy efficiency.

8. PATENT

The Contractor warrants that the goods do not infringe on any patent rights and agrees to infringe on any patent rights and agrees to defend, indemnify and hold the City of Battle Creek, its officers, agents employees, trustees and its successors and assigns, harmless from and against any and all liabilities, loss, damage or expense, including without limitation, court costs and reasonable attorneys' fees, arising out of any infringement of any letters, patent, trade name, trademark, copyright or trade secret by reason of the sale or use of any goods purchased under the Contract. The City of Battle Creek makes no warranty that the production, sale or use of goods under this Contract. The City of Battle Creek makes no warranty that the production, sale or use of goods under this Contract will not give rise to any such claim and the City of Battle Creek shall not be liable to the Contractor for any such claim brought against the Contractor.

9. GOVERNMENT AUDIT

The Contractor shall permit the Government or its authorized representative to inspect and audit all data and records relating to the performance of this Project for a period of three (3) years after final payment is made to the Contractor. For such inspection and audit, the Contractor shall retain all data and records pertaining to this Project. The periods of access and examination for data and records which relate to litigation of the settlement of claims arising out of the performance of this Contract as to which exception has been taken shall continue until such litigation, claims or exceptions have been disposed of. All reports must follow guidelines set forth in 24 CFR number 570.507.

10. COPYRIGHTS

The Federal awarding agency reserves a royalty-free, non exclusive, and irrevocable license to reproduce, publish or otherwise use, and to authorize others to use for Federal Government purposes:

- a) The copyright in any work developed under
- b) a grant, subgrant, or contract under a grant or subgrant; and
- c) Any rights of copyright to which a grantee, subgrantee or a contractor purchases ownership with grant support.

11. INSPECTION BY FEDERAL OFFICIALS

The Contractor agrees to permit the City of Battle Creek or their designee, or the Comptroller General of the United States, or their authorized representatives, to inspect all Project work, materials, payrolls, and other data, and to audit the books, records, and accounts of the Contractor and its contractors pertaining to the Project. The Contractor agrees to require each third party contractor whose contract award is not based on competitive bidding procedures to permit the City of Battle Creek, or the Controller General of the United States, or their duly authorized representatives, to inspect all work, materials, payrolls, and other data and

FEDERAL GUIDELINES

records involving that contract, and to audit the books, records, and accounts involving that contract as it affects the Project.

12. RESTRICTIONS ON LOBBYING

Bidders shall complete and submit as part of their bid the Certification of Restrictions on Lobbying for all projects when the total aggregate value of the contract exceeds \$100,000. The Contractor shall also submit a list of subcontracts and subcontractors which will exceed \$100,000. A Certification of Restrictions On Lobbying shall be submitted by the bidder for each listed subcontractor prior to contract award.

13. FEDERAL LAWS AND REGULATIONS

The Contractor understands that Federal laws, regulations, policies, and related administrative practices applicable to this Agreement on the date the Agreement was executed may be modified from time to time. The Contractor agrees that the most recent of such Federal requirements will govern the administration of this Agreement at any particular time, except if there is sufficient evidence in Agreement of a contrary intent.

To achieve compliance with changing Federal requirements, the Contractor agrees to include in all agreements with subcontractors and third party contracts financed with HUD assistance specific notice that Federal requirements may change and the changed requirements will apply to the project as required. All standards or limits set forth in this Agreement to be observed in the performance of the Project are minimum requirements.

14. PAYMENT OF PREVAILING WAGES & FRINGE BENEFITS FOR FEDERALLY FUNDED PROJECTS

No contract, agreement, understanding or other arrangement, whether oral or written, for the performance of services or work for and on behalf of the City of Battle Creek, involving craftsmen, mechanics and laborers employed directly upon the site of the work shall be entered into, approved or executed unless such contract, agreement, understanding or arrangement requires that all craftsmen, mechanics and laborers so employed shall receive at least the prevailing wages and fringe benefits for corresponding classes as determined and published by the Davis-Bacon Division of the United States Department of Labor for the greater Battle Creek area. In addition, such contract, agreement, understanding or arrangement shall provide that all subcontracts entered into by the Contractor, and all such contracts, agreements, understanding or arrangements shall provide that all contractors and subcontractors engaged in the performance of services or work for the City to which this applies shall, at the request of the City, furnish proof satisfactory to the City that the foregoing provisions of such contract and subcontract are being complied with. (See Davis-Bacon forms - Appendix A) Contractor must check with the Contract Compliance Office 10 Days before the bid opening to verify that the bid document contains the latest Wage Determination. The law requires that the determination to be used on each project must be no older than 10 days before the bid opening date.

15. DEBARMENT & SUSPENSION

Debarment and Suspension (E.O.s 12549 and 12689) - No contract shall be made to parties listed on the General Services Administration's List of Parties Excluded from Federal Procurement or Non procurement Programs in accordance with E.O.s 12549 and 12689, "Debarment and Suspension," as set forth in 24 CFR part 24. This list contains the names of parties debarred, suspended, or otherwise excluded by agencies, and contractors declared ineligible under statutory or regulatory authority other than E.O. 12549. Contractors with awards that exceed the small purchase threshold shall provide the required certification regarding its exclusion status and that of its principal employees.

16. DRUG-FREE WORKPLACE REQUIREMENTS

Drug-Free Workplace Requirements - The Drug-Free Workplace Act of 1988 (42 U.S.C. 701) requires grantees (including individuals) of federal agencies, as a prior condition of being awarded a grant, to certify that they will provide drug-free workplaces. Each potential recipient must certify that it will comply with drug-free workplace requirements in accordance with the Act and with HUD's rules at 24 CFR part 24, subpart F.

17. CDBG AND HOME (ONLY) PROJECT -SECTION 3 CLAUSE

The Contractor will certify that they have complied with the requirements of Section 3 of the Housing & Urban Development Act of 1968, as amended, 24 CFR Part 135.

- A. The work to be performed under this contract is subject to the requirements of section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (Section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by section 3, shall, to the greatest extent feasible, be directed to low-and very low-income persons, particularly persons who are recipients of HUD assistance for housing.
- B. The parties to this contract agrees to comply with HUD's regulations in 24 CFR part 135, which implement section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the part 135 regulations.
- C. The contractor agrees to send to each labor organization or representative of workers with which the contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers; representative of the contractor's commitments under this section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.
- D. The contractor agrees to include this section 3 clause in every subcontract subject to compliance with regulations in 24 CFR part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR part 135.
- E. The contractor will certify that any vacant employment positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR part 135 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR part 135.
- F. .Noncompliance with HUD's regulations in 24 CFR part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.
- G. With respect to work performed in connection with section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians, and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of sections 3 and section 7(b) agree to comply with section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

FEDERAL GUIDELINES

CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

DATE: _____

NAME: _____

TITLE: _____

FIRM: _____

FEDERAL GUIDELINES

CERTIFICATION OF PRIMARY CONTRACTOR REGARDING DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS

The undersigned certifies to the best of its knowledge and belief that it and its principals:

- (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- (b) Have not within a three year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property.
- (c) Are not presently indicated for or otherwise criminally or civilly charged by a government entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
- (d) Have not within a three year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

If the undersigned is unable to certify to any of the statements in this certification, an explanation shall be attached.

I certify or affirm the truthfulness and accuracy of the contents of the statements submitted on or with this certification and understand that the provisions of 31 U.S.C. Section 3801 et seq. are applicable thereto.

Name & Title of Authorized Representative

Signature of Authorized Representative Date

The undersigned legal counsel for the applicant hereby certifies that the applicant has authority under State and local law to comply with the subject assurances and that the certification above has been legally made.

Signature of Applicant's Attorney

Date

CERTIFICATION OF LOWER TIER PARTICIPANTS (SUBCONTRACTORS)

REGARDING DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS

The Primary Contractor, _____, certifies to the best of its knowledge and belief, that it and its principals:

1. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
2. Have not within a three (3) year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or Local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
3. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or Local) with commission of any of the offense enumerated in paragraph (2) of this certification; and
4. Have not within a three (3) year period preceding this application/proposal had one (1) or more public transactions (Federal, State, or Local) terminated for cause or default.

If the above named Primary Contractor is unable to certify to any of the statements in this certification, the Primary Contractor shall attach an explanation to this certification.

The Primary Contractor, _____, certifies or affirms the truthfulness and accuracy of the contents of the statements submitted on or with this certification and understands that the provision of 31 U.S.C. Section 3801 et seq are applicable thereto.

Signature and Title of Authorized Official

The undersigned chief legal counsel for the _____ hereby certifies that the _____ has authority under State and local law to comply with the subject assurances and that the certification above has been legally made.

Signature of Applicant's Attorney

Date

BC 19-08

SECTION IV - GENERAL SPECIFICATION FOR WATERMAIN**TABLE OF CONTENTS**

I	GENERAL	47
1	Description	47
II	CONSTRUCTION MATERIALS	47
1	General	47
2	Governing Standard Specifications:	48
3	Type of Joints	48
4	Valves and Boxes	48
5	Fittings	50
6	Thrust blocks	50
7	Fire Hydrant Assemblies	50
8	Water Service Connections	51
9	Pipe Casing	51
10	Pipe Testing	51
11	Concrete (Except Thrust Blocks)	52
12	Mortar	52
13	Granular Material	52
14	Disinfection Materials	52
15	Manholes and Covers	52
16	Other Materials	52
III	Construction Methods	52
1	Scope of Work	52
2	Excavation and Trenching	52
3	Dewatering	53
4	Disposal of Water During Construction	53
5	Bracing and Sheet piling	53
6	Installation of Pipe and Fittings	53
7	Cutting Pipe	54
8	Connections to Existing Water Mains	54
9	Valve Boxes	54
10	Hydrants	55
11	Backfill	55
12	Water Service	55
13	Removing Existing Hydrants	55
14	Winter Maintenance	55
IV	Hydrostatic Testing	56
1	General	56
2	Pressure Test	56
3	Leakage Test	56
V.	Disinfection of the System	57
1	General	57
2	Chlorination	57
3	Materials	57
4	Method of Chlorination	57

I GENERAL

1 Description

This work shall consist of installing and placing into operation water main, water services and hydrants of the required class and the specified sizes; and shall include excavation and backfilling. The Contractor shall furnish all labor, equipment and materials.

Unless otherwise specified, all work and materials shall conform to the requirements of the *current Specifications for Construction* of the Michigan Department of Transportation.

II CONSTRUCTION MATERIALS

1 General

Each pipe, fitting or special section shall have plainly and permanently marked thereon:

- a Pipe class.
- b Thickness class.
- c Manufacturer's name or trademark.
- d On bends, the angle turned thereby.
- e Identification of specials to show proper location in line.
- f On beveled pipe, amount of bevel and point of maximum bevel.
- g Each end of each bevel end pipe, fitting, or special shall be marked with a stripe of paint, approximately 1½ inches wide and 2 feet long applied along the top centerline. The Contractor shall be responsible for the handling and storing of all materials.
- h Shop drawings and manufacturers detailed literature shall be submitted to the Engineer for approval before any work may begin. These drawings shall detail the thrust restraint design for the tees, valves and bends. Restraint shall be restraint joint pipe mechanism based on "Thrust Restraint Design for Ductile Iron" Second Edition 1986 as published by the Ductile Iron Pipe Research Association. Mechanical joint pipe is not acceptable. Thrust blocks shall not be considered for calculating restraint design. The design shall be based on 150 p.s.i. or two times the working pressure, whichever is greater.

2 Pipe

- a **Ductile Iron Pipe.** - Ductile iron pipe shall be of a class and designation as shown on the Proposal or Plans; and shall conform to ANSI A21.51, AWWA C-151 and WW-P-421C. Pipe shall be cement lined and tar coated outside. Pipe shall be furnished and installed complete with all jointing materials and accessories, anchor and blocking, and other necessary appurtenances.
- b **PVC Pipe.** - Polyvinyl-chloride (PVC) pipe shall be of a class and designation as shown on proposal, plans and/or Special Conditions, with a SDR of 18 to 13.5 or less compound designation Class No. 12454, ASTM D-1784. PVC pipe shall be in accordance with the current AWWA Standard C-900.
- c **Prestressed Concrete Cylinder Pipe.** - Prestressed concrete cylinder pipe shall be of a class or designation shown on the Proposal or Plans, and shall conform to AWWA C-301. Pipe shall be furnished and installed complete with all jointing materials and accessories, anchor and blocking, and all necessary appurtenances.
- d **Steel Pipe.** - This section covers steel pipe, fittings, specials and appurtenances. Steel pipe and fittings shall be furnished and installed in the services where required or where permitted by the pipeline schedule section.
- e All 6 inch and smaller steel piping and lightweight steel pipe are not covered in this section.

- f Steel piping shall be furnished and installed complete with all fittings, specials, flanges, couplings, joint harnesses, anchors, anchor bolts, anchor inserts in concrete, expansion anchors, flange gaskets, flange bolts and nuts, pipe supports and hangars, wall fittings, blind flanges, connections, appurtenances, and accessories which are shown on the drawings or are required for proper installation and functioning of the piping.

2 Governing Standard Specifications:

Except as modified or supplemented herein, all steel pipe, fittings and specials shall conform to the applicable requirements of the following standard specifications:

AWWA Standard	Title
C-200	Steel Water Pipe 6 Inches and Larger
C-203	Coal-Tar Enamel Protective Coatings for Steel Water Pipe
C-205	Cement-Mortar Protective Lining and Coating for Steel Water Pipe 4 Inch and Larger - Shop Applied
C-206	Field Welding of Steel Water Pipe Joints
C-207	Steel Pipe Flanges
C-208	Dimensions for Steel Water Pipe Fittings
C-209	Cold Applied Tape Coatings for Special Sections, Connections, and Fittings for Steel Water Lines
C-602	Cement-Mortar Lining of Water Pipelines in Place

3 Type of Joints

Mechanical joints shall conform to the appropriate AWWA/ANSI specification for ductile iron or gray iron pipe or fittings.

- a "Push-on" joints shall be provided with rubber gaskets for a compression type joint.
- b Flanged joints. - Cast iron flanged fittings shall meet ANSI Specification B16.1 and shall be assembled in accordance with the manufacturer's recommendations. Bolts and nuts shall be of steel, cadmium plated. Gaskets shall be red rubber ring 1/8 inch thick.
- c Rubber gaskets shall conform to ANSI A21.11, AWWA C-111, and AWWA C-115.
- d Fittings, valves and hydrants shall be mechanical joints in accordance with the above specifications unless specified otherwise.

4 Valves and Boxes.

a Gate Valves.

- (i) All gate valves shall be resilient seated, manufactured to meet or exceed the requirements of AWWA C-509 or Latest Revision.
- (ii) Gate valves shall be built to withstand a 150 p.s.i. working pressure.
- (iii) Gate valves shall have an unobstructed waterway equal to or greater than the full nominal diameter of the valve.
- (iv) Each gate valves is to have a non-rising stem with the stem made of cast, forged, or rolled bronze. Two stem seals shall be provided and shall be of the O-ring type located above or below the stem collar.

- (v) The stem nut, also made of bronze, may be independent of the gate or cast integrally with the gate. If the stem nut is independent of the gate, it shall be provided with a spherical bearing surface to eliminate binding of the stem and to provide a self-aligning seating mechanism. If the stem nut is cast integrally, the threads shall be straight and true with the axis of the stem to avoid binding during the opening or closing cycle.
 - (vi) The seating mechanism shall consist of a cast iron gate having a vulcanized synthetic rubber coating or a rubber seat mechanically retained on the gate. The resilient seating mechanism shall provide zero leakage at the water working pressure when installed with the line flow in either direction.
 - (vii) The gate design shall be such that no line fluid entrapment can take place within the gate while the gate is in a raised position.
 - (viii) The valve body, bonnet, and bonnet cover shall be cast iron, ASTM A126, Class B. All internal and external surfaces shall be coated with epoxy to a minimum thickness of 4 mils. Approved coating shall be Pratt and Lambert Vitralon Powder Coating Epoxy or Mueller H P (R) Coating.
 - (ix) All valves are to be tested in strict accordance with AWWA C-509, Section 6.
 - (x) The City of Battle Creek will accept Waterous, American Darling, Kennedy, or an approved alternate.
- b **Butterfly Valves.**
- (i) Butterfly valves shall comply with the latest revision of AWWA Standard C-504 Class 150B.
 - (ii) Butterfly valves shall be built to withstand a 150 p.s.i. working pressure.
 - (iii) Butterfly valve bodies shall be cast iron ASTM A126 Class B with mechanical joint ends complete with accessories (rubber, bolts, and glands).
 - (iv) Butterfly valve discs shall be ductile iron ASTM A536 Grade 65-45-12. All internal cast iron parts exposed to flowing water shall be coated with black asphaltic.
 - (v) Butterfly valve body seating surface shall be stainless steel ASTM A276, Type 304. The mating seating shall be natural rubber or "Buna N Rubber" meeting the requirements of ASTM D2000. Seating shall be a 360 degree resilient seat fully field adjustable and field replaceable without valve disassembly.
 - (vi) Butterfly valve shafts shall be single solid stainless steel ASTM 276, Type 304. The shaft and disc shall be connected by means of O-ring sealed taper pin held in place by a self-locking nut. The disc shall be held in the center of the valve by factory set thrust rings or collars. Shaft seals shall be of O-ring type or V-type packing.
 - (vii) Installation is for buried service. The operator shall be key operated with a 2" square operating nut open left (counter clockwise).
 - (viii) The City of Battle Creek will accept the following: American Darling BF butterfly valve, or an approved alternate.
- c **Valve Boxes.** - All buried valves shall be provided with valve boxes. Valve boxes shall be cast iron, extension sleeve type, suitable for the depth of cover required by the drawings. Valve boxes shall be not less than 5 inches in diameter, shall have a minimum thickness at any point of 3/16 inch, and

shall be provided with suitable cast iron bases and covers. Covers shall be of a round plug type suitable for easy removal, and shall have cast thereon the word "WATER."

- (i) All parts of valve boxes, bases and covers shall be coated by dipping in hot asphalt varnish.
- (ii) Top sections and covers for valve boxes for valves that are to be provided with position indicators shall be designed for proper installation of the position indicator and accessories.
- (iii) Valve boxes for 4 inch through 12 inch valves shall be Tyler 664-S, extensions shall be Tyler 58, 59, or 60.

- d **Service boxes.** Service boxes for curbstops 2 inches or less in size shall be Tyler 95-E; extensions shall be Tyler 151, 152, 153, or 154. The Tyler 6500 Enlarged Base shall be used on curbstops greater than 1¼ inch and less than or equal to 2 inches in size.

5 Fittings.

To be cast or ductile iron (pressure rating 350) of the mechanical joint type meeting AWWA C-110 (ANSI A21.10) and of size and type as shown on the plans. Compact fittings are not acceptable.

6 Thrust blocks.

Thrust blocks shall be made of MDOT Grade 30S (Metric Grade S3) concrete and shall be placed at all bends, dead ends, tees, hydrants, etc., and of the size and location as shown on the Plans. Thrust blocks shall be poured in place against undisturbed earth. Thrust blocks shall be installed in such a way as not to interfere with the bolts and joints of the water main or fittings. When installed on plugged pipe ends, they shall be constructed in such a way as not to interfere with future water main extension. When thrust blocks are constructed in trenches with disturbed earth or unstable soil backing, tie rod clamps and fittings shall be installed as part of the thrust block construction.

7 Fire Hydrant Assemblies.

- a Hydrants shall conform to AWWA C-502 and shall have a minimum 5¼ inch valve opening with a 6 inch mechanical joint base and a 6 inch mechanical joint auxiliary gate valve between the water main and the hydrant. All hydrants shall be of a "breakable" or "traffic" design with replaceable sections or components of the barrel and stem. Hydrants shall have a compression type shutoff, opening with or against the pressure and which will remain closed in the event of accident, damage or breaking of the hydrant barrel. Auxiliary gate valves shall be provided with a valve box.
- b Hydrants shall be provided with a breakaway flange and have two standard 2½ inch hose nozzles and one 4½ inch pumper nozzle with National Standard Fire Hose threads. Hydrants shall open left (counter-clockwise) unless otherwise specified. Nozzle caps shall be equipped with cap gaskets and chains. Hydrants shall be designated for 150 p.s.i. working pressure and 300 p.s.i. hydrostatic pressure and shall conform to the current specifications of the American Water Works Association. Hydrants shall have O-ring packing. Hydrants, including tops and nozzle caps, shall be painted chrome yellow.
- c Operating nuts are to be pentagonal in shape, measuring 1½ inches from flat to point. Height of the nut shall be at least 1 inch.
- d The main valve construction at the bottom of the hydrant shall be fitted with a threaded drain fitting with threaded plug to permit the water to drain from the barrel when the main valve is closed. The main valve stem seats and packing glands shall be of bronze or approved rust-resisting metal and shall be constructed in such a manner as to be easily replaced without excavating the valve. The main valve facing shall be of chrome-toned leather or rubber, full faced tapered and waterproof.
- e Hydrant plugs shall be in place upon delivery to the site and shall be removed only by the Engineer's direction. Hydrant plugs shall be pipe threaded brass plugs.

- f Aggregate 2G, 3G, 5G or 34R shall be placed at the base of all hydrants where necessary for drainage. The specification for Aggregate 2G appears in the 1996 edition of the MDOT *Standard Specifications for Construction*.
- g The depth of bury (depth from the ground line of the hydrant to the invert of the connection pipe) of the hydrant assembly (as manufactured) shall be 4 feet, 4½ feet, 5 feet, 5½ feet, or 6 feet. Additional depth of bury may be obtained by using hydrant extensions.
- h The City of Battle Creek will accept East Jordan 5-BR Traffic Model or an approved alternate.

8 Water Service Connections.

- a Copper pipe service connection, ¾ inch to 2 inch, shall be in accordance with ASTM Specification B88, or Federal Specification WW-T-799; "Type K", soft temper copper.
- b Plastic pipe service connection shall be type ABS, PB, PE or PVC plastic pipe, National Sanitation Foundation approved and stamped, pressure rated at 125 p.s.i. minimum. The pressure rating shall be stamped on the pipe. Plastic adapters with stainless steel clamps shall be used at the joint of the plastic pipe with the bronze corporation and curb stops.
- c Corporation stops shall be bronze, AWWA C-800 Table 1 standard inlet with AWWA standard outlet for compression fitting. Corporation stops for plastic services shall have standard pipe threaded outlet (Table 1).
- d Curb stops shall be bronze, AWWA C-800 standard for compression fittings.
- e Curb boxes shall be cast iron, 2½-inch shaft, adjustable, Buffalo pattern. Boxes shall include a steel rod welded to a clevis at the bottom and an alignment washer near the top. A brass cotter pin shall be used to fasten the rod clevis to the operating nut of the curb stop.
- f Service clamps for service connections shall be of the double strap type, cast iron, with all steel parts galvanized or cadmium plated, similar to Mueller #H-10526.
- g Fittings for copper water services shall be of the flared type. Soldered joints shall not be used where pipe is buried.
- h Large services, in nominal sizes greater than 2 inches shall be subject to special request and designed individually. Large services, 4 inches and over, shall be subject to the same specifications as for water main.
- i Pipe Saddles - Corporation stops installed on ductile or cast iron pipe with services larger than 1 inch, or PVC or asbestos-cement water mains shall be attached by means of a double strapped malleable iron, gasketed, saddle adapter.
- j Miscellaneous - Two 6-foot curb stop keys and two service box keys of an adequate length to operate the valves shall be furnished to the City with the service boxes as part of the project.

9 Pipe Casing.

Shall be of the specified thickness, uncoated steel pipe and shall conform to ANSI B36.10. All casing joints shall be welded.

10 Pipe Testing.

At the discretion of the Engineer, pipe shall be tested for conformity with AWWA and ASTM specifications. The Engineer may choose one pipe per 1,000 feet of construction. The entire costs of testing shall be the Contractor's responsibility, whether performed by an independent testing lab or as part of the manufacturer's quality control.

11 Concrete (Except Thrust Blocks).

Shall be MDOT Grade 35S (Metric Grade S2)

12 Mortar.

Shall be MDOT Type R-2.

13 Granular Material.

Shall be Class II, IIA, III or IIIA; except that all material must pass a 2 inch sieve. Granular Material Class III with 100 percent passing a 2-inch sieve may be substituted for the Granular Material Class IIIA shown on MDOT Special Detail IV-83 series.

14 Disinfection Materials

Shall conform to the standards in the section "Disinfection of the System"

15 Manholes and Covers.

Shall conform to the applicable requirement of the MDOT *Standard Specifications for Construction* and the MDOT *Road and Bridge Standard Plans*. Manholes shall have a minimum inside diameter of 4 feet (or 1200 mm for manholes built to metric standards). Each manhole structure shall be furnished with an MDOT "Q" cover.

16 Other Materials.

As shown on the applicable Plan or Specification.

III Construction Methods**1 Scope of Work**

This section deals with placement of pipe, fittings, etc. and construction of the system. It is the Contractor's task to proceed with the construction as rapidly and as expeditiously as possible and to present the City with a complete, sound, and operable piping system.

2 Excavation and Trenching.

Shall conform to the requirements of the MDOT *current Specifications for Construction* Sections 5.13 and 5.14 and MDOT Special Detail IV-83 series. Water pipe shall be laid according to Trench Detail F or G, as specified, on Special Detail IV-83 series unless otherwise noted. Trenching for all underground pipes shall be excavated to a depth that will result in a minimum cover of six feet over the pipe. Unless otherwise permitted by the Engineer, no more than 200 feet of trench shall be opened in advance of construction. Pedestrian crossings shall be erected and maintained by the Contractor where designated by the Engineer. The Contractor shall provide access to homes, commercial, industrial, etc. establishments as soon as backfill is completed. Said access shall also be provided during periods when the Contractor is not performing construction operations.

At the end of each working day, all open ditches shall be closed or fenced off and barricaded until the next working day. No trench shall be left open over a weekend or holiday.

The Contractor shall support, move, or have moved all utility poles that interfere with the construction of the project. All costs connected with the movements or supporting of such poles shall be at the Contractor's expense.

"Abnormal trench conditions" are defined as trenches excavated in muck, peat, landfill or other unstable material. If the Contractor encounters abnormal trench conditions he will immediately notify the Engineer. Trenches through these areas shall be excavated, bedded and backfilled with granular material as deemed adequate by the Engineer.

3 Dewatering

Dewatering of trenches shall be performed as necessary and shall conform to *current Specifications* Section 5.13, with the following additional requirements.

- i The Contractor shall perform his dewatering operations whenever groundwater conditions create an unstable trench bottom. An unstable trench bottom is defined as "Conditions that prevent placement of pipes true to line and grade."
- ii The method of dewatering will be subject to review by the Engineer.
- iii The City will be responsible for temporary service of an individual water supply where these supplies are cut off due to lowering of the water table during construction. The Contractor shall not lower the water table unnecessarily.
- iv All dewatering wells that have a bore hole diameter of two inches or more shall be plugged and abandoned by the following method or any method that has been approved in writing by the Michigan Department of Public Health, in accordance with the State of Michigan's "Mineral Well Act," Public Act 315 of 1969.
- v Once the casing and screen have been removed from the bore hole, an injector pipe shall be installed in the bore hole to the bottom of the gravel pack material. Neat cement or bentonite slurry shall be pumped through the injection pipe until the material is five feet above the gravel pack material or four feet below the existing gravel level. The remainder of the bore hole shall be plugged with native soil.

4 Disposal of Water During Construction

Any water removed from the trench or the water main shall be disposed of in such a way as not to damage property, create a public nuisance or a health problem.

5 Bracing and Sheet piling

The Contractor shall furnish, install and maintain such sheet piling, bracing and shoring, as may be required to support the sides of the excavation and to prevent any movement of earth which would create safety hazards, injure or delay the work or cause damage to pavement, sewers or other existing structures. The Contractor shall be totally responsible for the sufficiency of such supports. Whenever timber sheet piling is driven for the protection of trench walls in water bearing soil, the portion of such sheet piling, below a level four feet above the top of pipe, shall be left in place.

6 Installation of Pipe and Fittings

Before installation, the pipe shall be inspected for defects and any section of pipe or fittings found to be defective, before or after laying, will be rejected and replaced with sound pipe without additional expense to the City.

Water pipe shall be laid according to Trench Detail F or G, as specified, on MDOT Special Detail IV-83 series. The interior of the pipe and fittings shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations by plugging the ends or by other approved methods. When work is not in progress, the open ends of the pipe and fittings shall be securely closed so that no trench water, earth, animals, or other substances will enter the pipes.

No pipe or fittings shall be placed in water or when the trench or weather conditions are unsuitable for work except by permission of the Engineer.

The full length of each section of pipe shall rest solely upon the pipe bed, with recesses provided to accommodate the bells and joints.

Deflections from a straight line or grade, as required by vertical curves, horizontal curves, or offsets, shall not exceed tolerances recommended by the pipe manufacturer. If the alignment requires deflections in excess of the manufacturer's recommendations, special bends or a sufficient number of shorter lengths of pipe shall be furnished to provide the angular deflection required. Frequent or abrupt changes in the slope of the pipe, even if necessary to follow the existing ground surface elevations, will not be permitted.

Pipe shall be placed with bell ends facing in the direction of laying, unless otherwise approved by the Engineer.

Joining of the various pipe materials and types shall be made in accordance with the manufacturer's recommendations.

7 Cutting Pipe

Cutting pipe for inserting valves, fittings, etc. shall be performed in a neat and workmanlike manner, without damage to the pipe or lining, and so as to leave a smooth end at right angles to the axis of the pipe.

For cast iron and ductile iron pipe, cutting shall be performed with a power saw, or a roller or shear type cutter for pipe sizes up to 20 inches in diameter. When machine cutting is not available for cutting pipe 20 inches in diameter or larger, the electric arc cutting method will be permitted, using a carbon or steel rod. Only qualified and experienced workmen shall perform this work.

For asbestos-cement or PVC pipe, cutting shall be performed by power saw, hand saw, abrasive disks or with a special asbestos-cement or PVC cutting tool. All piping cutting tools must be of the true cutting variety. Under no circumstances is the pipe to be cut with a roller or shear type cutting tool.

8 Connections to Existing Water Mains

The Contractor, without prior permission from the City, shall operate no valve or other control on the existing system for any purpose. It is the responsibility of the Contractor to notify all persons to be affected by any shut off at least 48 hours prior to the operation of any valves.

Connections shall be made with line pressure on or off according to the Plans or Proposal. Existing pipelines shall be adequately supported during the cutting operations and prior to placement of backfill. Thrust blocks shall be placed behind all connected fittings.

Prior to cutting existing pipelines, the surface of the existing pipe shall be thoroughly cleaned by wire brushing and scraping. When cut-in is made under pressure, the existing pipe surface shall be washed down with a 4 percent solution of chlorine prior to installing the cutting-in tee. All fittings, pipe, valves, etc. used in the connection that cannot be disinfected during normal water main chlorination shall be swabbed out with a 4 percent or stronger solution of chlorine, such as standard laundry bleach, during assembly. Care shall be exercised in order to prevent contamination of the existing water mains and failure to comply with this requirement will necessitate chlorination of the existing water mains at the Contractor's expense.

After the connection is made, the Contractor shall flush sufficient water through the connection to effect removal of the chlorine solution.

All valves will be turned to the open position at the final inspection.

9 Valve Boxes

Unless otherwise specified, a metal valve box shall be provided for every valve. The valve box shall not transmit shock or stress to the valve when the box cover is flush with the surface of the pavement or other such level as may be directed. The base section of the valve box shall be set two inches above the flanged bonnet joint of the valve and accurately centered on the valve operating nut.

10 Hydrants

Hydrants shall stand plumb and have hose nozzle parallel with the roadway, with the pumper nozzle facing the roadway.

Hydrants shall be installed in conformance with AWWA C-600 and AWWA M-17. Hydrants shall be set to the established grade, with the breakaway no more than 8 inches above the finished topsoil grade or as directed by the Engineer. Nozzles should be placed at least 21 inches above the finished topsoil grade. Hydrants set with elbow or hydrant tee shall be rotated 90 degrees to conform with the above.

At least 3 feet of horizontal clearance shall be provided around each hydrant.

Hydrants must be connected to the main with a 6-inch branch and controlled by an independent gate valve. In the case of relocated four-inch hydrants, four-inch valves shall be used. This Valve on Branch shall be located no less than 18 inches or greater than 36 inches from the hydrant unless otherwise shown on the plans. Each Valve on Branch shall be left open prior to pressure testing and disinfection and shall be left open prior to final acceptance.

Whenever a hydrant is set in clay or other impervious soil, a drainage pit 2 feet in diameter and 3 feet deep shall be excavated below each hydrant and filled compactly with 2G, 3G, 5G, or 34R aggregate under, around, and to an elevation 6 inches above the waste opening.

11 Backfill

Shall conform to the requirements of the *current Specifications* Sections 5.13 and 5.14 and Special Detail IV-83G.

12 Water Service

All water services shall originate at the tap into the water main in the street with a corporation stop and terminate at, and include, the curb stop and service box located within 5 feet outside of the property line. All services shall be tapped at the 2 o'clock or 10 o'clock positions. Services shall be installed at a depth of 5 feet below the final grade. Short services shall be installed by boring. Borings may be made by the "Augur" or "Missile" methods. Services installed under existing concrete or bituminous surfaces shall be installed by boring. Services installed under gravel surface may be by open trench or boring.

Where soil conditions in open trenches are not suitable for copper pipe, the pipe shall be embedded in Granular Material Class III and backfilled as specified.

All services shall be pressure tested for leaks and disinfected (chlorinated) before they are covered.

13 Removing Existing Hydrants

As specified in the *current Specifications* Section 2.07, except that the old hydrants will remain City property and will be salvaged. Hydrants removed shall be placed at a location on the project site designated by the Engineer for pickup by City forces.

14 Winter Maintenance

In the event that hazardous or nuisance conditions arise during the winter from the previous construction season's water main work, and such conditions are not corrected by the Contractor, the City shall notify the Contractor through the Engineer, in writing, that a deficiency exists and the specific location thereof. The Contractor shall, immediately upon such notification, correct the defective condition to the satisfaction of the City. Should the defective condition not be corrected promptly by the Contractor, the City may perform the required maintenance and deduct his incurred costs from the contract price.

If the Contractor so desires, and by prior written consent of the City, he may elect not to perform such inspections and/or maintenance, due to prohibitive travel distances or shortage of off season

manpower. Should the Contractor desire to initiate this exception, the City may perform the winter inspections and maintenance itself and deduct his incurred costs from the contract price.

IV Hydrostatic Testing

1 General

The Contractor shall pretest and be satisfied that all lines are ready for testing before requesting test inspection. The Contractor shall provide all necessary equipment and perform all work required in connection with the tests.

2 Pressure Test

The test shall conform to AWWA C-600. After the pipe has been laid, all newly laid pipe or any valved section thereof shall be subjected to a hydrostatic pressure of at least 1.5 times the working pressure at the point of testing. Test pressures shall:

- i Not be less than 150 p.s.i. nor 1.25 times the working pressure at the highest point along the test section.
- ii Not exceed pipe or thrust-restraint design pressures.
- iii Be at least two hours duration.
- iv Not vary by more than ± 5 p.s.i. for the duration of the test.
- v Not exceed twice the rated pressure of the valves or hydrants when the pressure boundary of the test section includes closed gate valves or hydrants.
- vi Not exceed the rated pressure of the valves when the pressure boundary of the test section includes closed, resilient-seated gate valves or butterfly valves.

Each valved section of pipe shall be filled with water slowly and the specified test pressure, based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the City. Valves shall not be operated in either the opening or closing direction at differential pressure above the rated pressure. Once this is accomplished, the system will be allowed to stabilize at the test pressure before conducting the leakage test.

The Contractor shall not pressure test against a tapping valve.

Before applying the specified test pressure, air shall be expelled completely from the pipe valves and hydrants. If permanent air vents are not located at all high points, the Contractor shall, unless otherwise approved by the City, install corporation cocks at such points so that the air can be expelled as the line is filled with water. After all the air has been expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, the corporation cocks shall be removed and plugged or left in place at the discretion of the City.

Any exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during the test. Any damaged or defective pipe fittings, valves or hydrants that are discovered following the pressure test shall be repaired or replaced with sound material and the test shall be repeated until it is satisfactory to the City.

3 Leakage Test

The leakage test shall be conducted concurrently with the pressure test. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof, to maintain pressure within 5 p.s.i. of the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water. Leakage shall not be measured by a drop in pressure in a test section over a period of time.

No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{SD\sqrt{P}}{133,200}$$

where L is the allowable leakage, in gallons per hour; S is the length of the pipe tested, in feet; D is the nominal diameter of the pipe, in inches; and P is the average test pressure during the leakage test, in p.s.i. gauge. This formula is based on an allowable leakage of 11.65 gallons per day per mile per inch nominal diameter at a pressure of 150 p.s.i.

If the pipeline under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakages for each size. When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gallons/hour/inch of nominal valve size shall be allowed.

When hydrants are in the test section, the test shall be made against the closed hydrants.

Acceptance shall be determined on the basis of allowable leakage. If any test of pipe laid disclosed leakage greater than that specified, the Contractor shall, at his own expense, locate and make repairs as necessary until the leakage is within the specified allowance.

All visible leaks are to be repaired regardless of the amount of leakage.

V. Disinfection of the System

1 General

Disinfection shall be by chlorination and/or other methods as approved by the Engineer after pressure testing and flushing. The disinfection shall conform to the current AWWA C-651 standards.

2 Chlorination

All new water lines shall be chlorinated. The Contractor shall furnish all labor, equipment, and materials necessary for effective chlorination of the water mains.

3 Materials

- a **High Test Calcium Hypochlorite (HTH, "Perchlolen", "Maxochlor", "Pittchlor").** - Powder and water shall be mixed to form a 1 percent chlorine solution (10,000 ppm), pumping solution at a constant rate into the water main while bleeding off the water at the extreme end.
- b **Liquid Chlorine.** - Liquid chlorine conforming to AWWA B-301 may be applied to the water main much the same way as the hypochlorite solution listed above.
- c **Chlorine Gas.** - Chlorine gas shall not be used.

4 Method of Chlorination

The chlorination agent shall be applied at the beginning of the section adjacent to the feeder main and shall be injected through a corporation cock, hydrant or other connection, insuring treatment of the entire line. Water shall be fed slowly into the new lines with chlorine applied to produce a dosage of not less than 50 ppm. Mains previously filled shall be treated to a concentrated dosage at intervals along the line and retained for a period of not less than 12 hours. A chlorine residual of not less than 5 ppm shall be produced in all parts of the line. During chlorination, all new valves and accessories shall be operated.

After chlorination, the water shall be flushed from the line at its extremities until all of the heavily chlorinated water has been removed, leaving a residual chlorine content not greater than 1.0 ppm.

After the applicable retention period, heavily chlorinated water shall not remain in prolonged contact with the pipe. In order to prevent damage to the pipe lining or corrosion damage to the pipe itself, the heavily chlorinated water shall be flushed from the main until chlorine measurements show that the concentration in the main is no higher than that generally prevailing in the distribution system or is acceptable for domestic use.

The chlorine concentrations in the discharged chlorination water shall not exceed the limits imposed by the Michigan Department of Environmental Quality and other regulatory agencies. Chlorine concentrations in discharges that occur over a period of 160 minutes or less shall not exceed 0.5 milligrams per liter. Chlorine concentrations in discharges that occur over a period longer than 160 minutes shall not exceed 0.038 milligrams per liter.

The environment into which the chlorinated water is to be discharged shall be inspected. If there is any possibility that the chlorinated discharge will cause damage to the environment, then a neutralizing chemical shall be applied to the water to be wasted to neutralize thoroughly the chlorine residual remaining in the water. Where necessary, Federal, state and local regulatory agencies shall be contacted to determine special provisions for the disposal of heavily chlorinated water.

The Contractor shall collect water samples in sterile bottles containing sodium thiosulphate for bacteriological analysis from the end-most outlet of the pipeline. Two samples shall be taken 24 hours apart for each section of line tested. If both samples show safe results and meet the Safe Drinking Water Standards, the new pipeline may be placed in service. If, however, the results are unsafe, a repetition of the chlorine treatment is necessary. Samples will never be taken from hoses or fire hydrants. A suggested sampling tap is a corporation cock with a copper gooseneck assembly. The gooseneck assembly may be removed after use. At the option of the City, samples shall be taken during chlorination.

IV Measurement and Payment

The complete work as measured for Water Main will be paid for at the contract unit prices for the following items (pay items). Each item includes supplying all necessary material, equipment, and labor.

Pay Item.....	Pay Unit
Removing Gate Well	Each
Removing Hydrant.....	Each
Abandon Gate Well	Each
Service Abandonment	Each
Ductile Iron Water Main, __", Trench Detail __	Linear Feet
PVC Water Main, DR __, __", Trench Detail __	Linear Feet
Prestressed Concrete Cylinder Pipe, __", Trench Detail __	Linear Feet
Prestressed Concrete Embedded Cylinder Pipe, __", Trench Detail __	Linear Feet
Steel Casing Pipe, __", Trench Detail __	Linear Feet
Steel Casing Pipe Jacked In Place, __"	Linear Feet
Air Release Valve	Each
Air Release Manhole	Each
Curb Stop and Box	Each
Gate Valve, __"	Each
Gate Well, __"	Each
Tapping Valve, __"	Each
Blowoff Valve, __"	Each
Blowoff Well, __"	Each
Fire Hydrant Assembly, 6"	Each
Gate Valve and Box, __"	Each
Meter Pit, __"	Each
Ductile Iron Plug, __"	Each
Water Main, __", Cut and Plug	Each
Adjust Hydrant.....	Each

Relocate Hydrant.....	Each
Reconstruct Gate Well	Each
Adjust Gate Well Cover	Each
Air Valve Well	Each
Entrance Manhole Well	Each
Cast Iron Drain, ____	Each
Adjust Gate Box	Each
Adjust Curb Box	Each
Bend, ____ Degrees	Each
Butterfly Valve, ____	Each
Fire Hydrant Assembly.....	Each
Tee, ____ X ____ X ____ Tee	Each
Live Tap With Valve, ____ X ____ X ____	Each
Thrust Block	Each
Restrained Joint Bell Plug	Each
Water Service, ____	Each
Pressure Test and Disinfect Water Main.....	Lump Sum

- 1 Water main, of the diameter, class, and trench detail specified, will be measured in place, by length in linear feet, from center to center of cross mains with no deductions in length for intermediate structures. Excavation and backfill will not be measured separately but shall be included as a part of the item of water main furnished and installed.
- 2 When unstable soil conditions, or obstructions, require that the trench be excavated below the elevation shown on the plans and backfilled with suitable material, such work shall be paid for as "Trench Undercut and Backfill" and be performed and measured as specified in the *current Specifications* Section 5.13.
- 3 If rock excavation is required, it will be paid for separately in accordance with Section 2.08 of the *current Specifications*. Dewatering Systems will be installed and paid for as specified in Section 5.13.
- 4 The water main appurtenances listed above will be paid for separately, on an each basis. Payment for all buried valves includes the valve box and cap.
- 5 "Air Release Manhole" includes the specified air release valve, all other water main appurtenances, manhole structure, and cover. Payment for Air Release Manhole is on an each basis.
- 6 Fire hydrant assemblies will be paid for on an each basis. The payment for fire hydrant assemblies includes the hydrant, tee, 6" resilient wedge valve and box, rodding, thrust block, up to 10'-6" of Class 52 cement lined ductile iron pipe, aggregate, hydrant extension kits and other accessories necessary to complete the installation to specification.
- 7 Water services will be paid for on an each basis. Payment for the water services includes any jacking or boring under the existing pavement, as directed by the Engineer.
- 8 Removing Hydrants will be paid for on an each basis. All existing hydrants will remain the property of the City and will be salvaged.
- 9 "Pressure Test and Disinfect Water Main" will be paid for only once. If the main fails to pass the first pressure and disinfection tests, further tests shall be made at the Contractor's expense. Payment for flushing and disposal of the disinfectant chlorinated water in accordance with environmental regulations is included in this item.

SECTION V - GENERAL SPECIFICATION FOR SANITARY SEWER**TABLE OF CONTENTS**

I	GENERAL:	62
1	Scope of Work	62
2	Shop Drawings	62
3	Standards	62
II	CONSTRUCTION MATERIALS	63
1	General	63
2	Vitrified Clay Sewer Pipe	63
3	Reinforced Concrete Sewer Pipe	63
4	Poly-Vinyl Chloride (PVC) Sewer Pipe	63
5	Ductile Iron Forcemain Pipe	63
6	Type of Joints	63
7	Fittings	64
8	Pipe Casing	64
9	Air Release Valves	64
10	Gate Valves and Boxes	64
11	Thrust Blocks	65
12	Cleanouts	65
13	Pipe Testing	65
14	Manhole Rings and Covers	65
15	Manholes	66
III	CONSTRUCTION METHODS	66
1	Scope of Work	66
2	Tree Removal	66
4	Excavation	66
5	Foundations, Strengthening	67
6	Tunnel Construction	67
7	Pipeline Installation	68
8	Ductile Iron Pipe Joints	68
9	Factory-Fabricated Resilient Material Joints for Clay Pipe	68
10	Rubber Gasket Joints for Reinforced Concrete Low Head and Cylinder Pressure Pipe	68
11	Connections for Service Pipes	68
12	Concrete Masonry Manholes	70
13	Adjustment of Manholes	70
14	Stubs Out of Manholes	70
15	9. Appurtenances	70
16	As-Built Data	70
V	RESTORATION OF DISTURBED FACILITIES	71
1	General	71
2.	Pavement, Curbs, Curbs and Gutters	71
3.	Driveways and Sidewalks	71
4.	Turf Establishment	71
5	Trees	71
V	COMPLETION OF CONTRACT	72
1	General	72
2	Water Infiltration Tests	72
3	Water Exfiltration Tests	72
4	Air Exfiltration Tests	72
5	Forcemain	73
6	Deflection Testing (PVC Pipe)	74
7	Responsibility	74
VI	MEASUREMENT FOR PAYMENT AND COMPENSATION	75
1	General	75
2	Pressure Pipeline	75

SANITARY SEWER

3	Fittings and Specials	75
4	Gravity Sewers, Conduits, Culverts and Drains	75
5	Manholes	75
6	Rock Excavation	76
7	Timber Piling.....	76
8	Timber Sheeting, Bracing and Cradles	76
9	Concrete Cradle and Encasement	76
10	Crushed rock or Gravel Refill.....	76
11	Sand or Gravel Trench Backfill	76
12	Pavement Replacement.....	76
13	Sidewalk, Driveways and Curb and Gutter Replacement.....	77
14	Ductile Iron Pipe and Fittings for Raising or Lowering Watermains will be done by City Forces.	77
15	Relocation of Water Service Pipes will be done by City Forces.	77

I GENERAL:

1 Scope of Work

- a All labor, materials, equipment, tools and services required for the furnishing, installation and testing of all gravity sewers, drains and appurtenances required by the City of Battle Creek shall be furnished and installed in compliance with the following General Specification, the Project Specifications and the Contract Drawings.
- b This General Specification designated as Section V, Sanitary Sewers, covers the description of materials generally utilized in sewer construction and the installation of such materials. Project Specifications and Contract Drawings designate the specific work, the materials, the lines, grades and details and the construction methods to be employed on the furnishing and installation of all Sanitary Sewers, and Appurtenances on this Contract.
- c All work shall be done in accordance with 1984 Standard Specification for construction of the Michigan Department of Transportation (MDOT) except as noted below or elsewhere in the contract documents.

2 Shop Drawings

- a Attention is directed to the provisions in the General Conditions of the Contract requiring the submission to the Engineer of descriptive details and of shop and setting drawings. On Sewer installation such submission shall include the following even though items proposed to be furnished conform to the exact description stated in the General or Project Specifications.
 - i Full details of pipe, fittings, specials, joints and the assembly thereof.
 - ii Joint materials and details.
 - iii Reinforcing steel bending and setting drawings.
 - iv Catalogue cuts and full details of all castings.
 - v Catalogue cuts and full details of gates.

3 Standards

- a Attention is directed to the provisions in the General Conditions of the Contract which states the full name of organizations publishing standard specifications and/or providing inspection serves, which organizations are named in the following specifications by abbreviations.
- b Where materials and methods are indicated in the following Specifications as being in conformance with a standard specification it shall refer in all cases to the latest edition of the specification and shall include all interim revisions. Listing of a standard specification without further reference indicates that the particular material or method shall conform with such listed specification.

4 Soil Erosion and Sedimentation Controls

The Contractor shall obtain any required permit(s) necessary for compliance with the "Soil Erosion and Sedimentation Control Act of Michigan", (Michigan Act No. 347 of the Public Acts of 1972), as amended. All erosion and sedimentation control measures shall be performed by the Contractor and shall be in strict compliance with said Act No. 347, and all stipulations of the acquired permit.

II CONSTRUCTION MATERIALS

1 General

All materials and equipment shall be furnished by an established and reputable manufacturer or supplier. All materials and equipment shall be new and shall be of first class ingredients and construction, designed and guaranteed to perform the service required and shall conform with the following Standard Specifications or shall be the product of the listed manufacturers or similar and equal thereto as approved by the Engineer.

2 Vitrified Clay Sewer Pipe

- a All vitrified clay sewer pipe furnished shall be of the bell and spigot type extra strength manufactured in accordance with ASTM Specifications C 700-71T, thoroughly sound and perfectly burned. Pipe shall be of full internal diameter. Pipe must be shipped in unit pallets. Pipe joints shall be ASTM Specification C 425-72.
- b Except where upgraded by latest revised issue of the National Clay Pipe Institute Specifications ER-4 for Standard and Extra Strength Pipe, all vitrified clay sewer pipe shall meet performance requirements of standards issued by the latest revised issue of the American Society for Testing and Materials Designation C-700 for extra strength pipe and standard strength pipe.

3 Reinforced Concrete Sewer Pipe

All reinforced concrete pipe furnished shall conform to ASTM designation C-76.

4 Poly-Vinyl Chloride (PVC) Sewer Pipe

All poly-vinyl chloride sewer pipe furnished shall have a standard dimension ration (SDR) of 35 or less. The pipe shall be clearly marked at intervals of 5 feet or less with the manufacturer's name or trademark, nominal pipe size, PVC call classification, SDR number and ASTM designation D-3034.

5 Ductile Iron Forcemain Pipe

Ductile iron pipe shall be Class 52, ANSI A21.51 1976 (AWWAC-151) with 60-42-10 physicals. Pipe shall be enamel lined and tar coated outside, to conform with ASA A21.4; AWWA C104; and Federal Specifications WW-P-42lb.

6 Type of Joints

- a Vitrified Clay Pipe Joints:
All vitrified clay sewer pipe furnished in this contract shall have the compression type joints conforming to the material and testing requirements of ASTM Standard C425, latest revised issue. Leakage allowance shall be as specified under "Field Performance Tests".
- b Ductile Iron Pipe Joints:
Ductile iron pipe joints shall be of the "slip" type, rubber gasket sealed, as recommended and supplied by the pipe manufacturer. The gasket shall be an elongated grooved gasket to effect the joint seal.

Mechanical joints shall be as specified in ASA.

- c Reinforced Concrete Pipe Joints:
Joints shall be flexible rubber gaskets conforming in every respect, and in strict accordance with the current ASTM Designation C-443.

SANITARY SEWER

The method of coupling the pipe shall be in strict accordance with the gasket manufacturer's recommendations.

- d Poly-Vinyl Chloride Pipe Joint (Sewer Pipe)
Poly-vinyl chloride pipe joints shall be bell and spigot with elastomeric rubber gasket, as recommended and supplied by the pipe manufacturer.

The elastomeric compound shall comply in all respects with the physical requirements specified in ASTM D1869, C361 or C443. The gasket shall provide an adequate compressive force against the sealing surfaces of the bell and spigot as to effect a positive seal under all combinations of the joint tolerances. The gasket shall be the only element dependent upon to make the joint flexible and water-tight.

Pipe joints shall be bell and spigot with elastomeric rubber gasket to effect a pressure seal. The gasket shall meet laboratory performance requirements of ASTM D3139. The gasket shall provide an adequate compressive force under all combinations of the joints tolerances.

7 Fittings

- a Vitrified Clay Fittings:
Fittings shall correspond in all respects with the dimensions specified for pipe of the corresponding size. Dimensional tolerances of fittings shall be the same as for the straight pipe. All fittings shall be in strict conformance with ANSI/ASTM C700.
- b Poly-vinyl Chloride Fittings (Sewer Pipe):
Fittings shall be made of PVC plastic having a cell classification of 12454-B or 12454-C as defined in Specification ASTM C1784.
- c Ductile Iron Fittings:
Fittings shall be ductile iron of the mechanical joint type AWWA Class D for 3 inches to 12 inches of AWWA C-101 Class B or D for 14 inches to 24 inches fittings, and of size and type as shown on the plans.

8 Pipe Casing

Pipe casing shall be extra heavy, uncoated, steel pipe and shall conform to American Standards Association Specification B36.10. All casing joints shall be welded.

9 Air Release Valves

Air release valves shall be constructed of cast iron body and cover, ASTM No. A48, Class 30, bronze trim, ASTM No. B143, stainless steel floats, ASTM No. A240 with shock proof synthetic seats for 300 psi, maximum pressure.

10 Gate Valves and Boxes

- a Gate valves shall be resilient seated, manufactured to meet or exceed the requirements of AWWA C509 or Latest Revision and in accordance with the following specifications.
- b Valves shall have an unobstructed waterway equal to or greater than the full nominal diameter of the valve.
- c The valves are to be non-rising stem with the stem made of cast, forged or rolled bronze. Two stem seals shall be provided and shall be of the O-ring type located above or below the stem collar.

SANITARY SEWER

- d The stem nut, also made of bronze, may be independent of the gate or cast integrally with the gate. If the stem nut is independent of the gate, it shall be provided with a spherical bearing surface to eliminate binding of the stem and to provide a self-aligning seating mechanism. IF the stem nut is cast integrally, the treads shall be straight and true with the axis of the stem to avoid binding during opening or closing cycle.
- e The seating mechanism shall consist of a cast iron gate having a vulcanized synthetic rubber coating or a rubber mechanically retained on the gate. The resilient seating mechanism shall provide zero leakage at the water working pressure when installed with the line flow in either direction.
- f The gate design shall be such that no line fluid entrapment can take place within the gate while the gate is in a raised position.
- g The valve body, bonnet and bonnet cover shall be case iron, ASTM A126, Class B. All internal and external surfaces shall be coated with epoxy to a minimum thickness of 4 mils. Approved coating shall be Pratt & Lambert Vitralon Powder Coating Epoxy or Mueller H P (R) Coating.
- h Valves shall have a 2" square operating nut. Valves shall open to left (counter-clockwise).
- i All valves are to be tested in strict accordance with AWWA C509, Section 6.
- j The City of Battle creek will accept Waterous, American Darling, Kennedy, or an approved alternate.

11 Thrust Blocks

Thrust blocks shall be made of at least 3,000 psi concrete and shall be placed at all bends, dead ends, tees, etc., and of the size and location as shown on the drawings. Thrust blocks shall be poured in place against undisturbed earth unless otherwise approved by the Engineer. Concrete shall be furnished by the Contractor. Thrust blocks shall be installed in such a way as not to interfere with the bolts and joints of the watermain or fittings. When installed on plugged pipe ends, they shall be constructed in such a way as not to interfere with future watermain extension. When thrust blocks are constructed in trenches with disturbed earth or unstable soil backing, tie rod clamps and fittings shall be installed as part of the thrust block construction.

12 Cleanouts

Cleanouts shall be installed where indicated on the plans and in accordance with the cleanout detail as shown on the detail drawing sheet.

13 Pipe Testing

At the discretion of the Engineer, pipe shall be tested for crushing strength, absorption and acid resistance as described in the current ASTM specifications for each pipe specified. The Engineer may choose one pipe per 1,000 feet of construction. The entire costs of testing shall be the Contractor's responsibility, whether performed by an independent testing lab, or as part of manufacturer's quality control, and shall be certified by a Registered Professional Engineer.

14 Manhole Rings and Covers

Rings and covers shall be specified on detail drawings. They shall be made of soft, gray iron and shall be free from any sand holes, blow holes, cold shuts and other defects and shall have a smooth surface without lumps or rough areas. They shall be machined to fit so that they will have an even bearing.

SANITARY SEWER

15 Manholes

Manholes shall be of precast reinforced concrete and shall conform to the current requirements for Reinforced Concrete Pipe, ASTM Designation C-76 or C-478, or ASTM Designation C-139 for concrete blocks.

III CONSTRUCTION METHODS

1 Scope of Work

This section of the specifications deals with placement of pipe, fittings, etc. and construction of the system. It is the basic task of the Contractor to proceed with the construction as rapidly, and as expeditiously as possible, to present the Owner with a complete, sound and operable piping system.

a Safety:

All current safety requirements shall be practiced by the Contractor to insure safe working conditions for the general public as well as his personnel. It shall be the responsibility of the Contractor to maintain safe conditions for his own personnel and the public. The Engineer and Owner will not accept liability of any kind for injury due to Contractor's construction operations.

b Maintenance and Protection of Existing Utilities:

The Contractor shall be responsible for interference with or damage to any existing utilities and shall replace or repair same with the least possible delay.

The approximate location of existing underground utilities and structures, such as watermains, sewers, valve vaults, manholes, etc., as shown on the Plans, have been determined from the best available information and are given for the convenience of the Contractor. However, the Owner does not assume responsibility that during construction, utilities and structures other than those shown may be encountered and that the actual locations of those which are shown may be different from the location as shown on the Plans.

It shall be the responsibility of the Contractor to determine ownership of all water, gas, electric, telephone and other utility lines, to contact these Owners, and determine location and required means of protecting and maintaining service and/or relocation of these utility lines. Any relocation of utilities required shall be considered incidental to construction of the affected facility.

Any underground utility mains and conduits exposed, including municipal watermains shall be protected and backfill material hand compacted or mechanically compacted to 6 inches over top of main or conduit. Any means used to support a utility exposed or endangered by the Contractor's operations is considered incidental. Also, relocating, raising or lowering of a utility for the Contractor's convenience, repair of utilities damaged by the Contractor and related temporary service required by extended periods of service outages are considered incidental.

2 Tree Removal

Shall conform to current standard specification of (MDOT) Sec 2.03.

3 Power Poles:

The Contractor shall support, move or have moved all utility poles which interfere with the construction of the project. All costs connected with the movements or supporting such poles shall be the Contractor's.

4 Excavation

Shall conform to current Standard Specification of MDOT Sec. 5-13.

5 Foundations, Strengthening

General shall conform with Standard Specification of Michigan Department of Transportation (MDOT) Section 2.09.

6 Tunnel Construction

- a Excavation in tunnels made beneath existing structures, across railroad right-of-way, existing pavements and sidewalks for the installation of pipe or conduits, shall be of sufficient size, height and/or conduits, to permit proper bracing of the tunnel section and to permit ample room for the prosecution of the work and safety of the workmen.
- b All tunnels shall be lined with full circle metal liner plates of sufficient strength to meet the loading conditions. Loading for highway and pavement tunnels shall be based upon continuous load carrying structures for the height of cover under H-20 loading and loading for railroad tunnels shall be based upon continuous load carrying structures for the height of cover under Cooper E-70 loading. Liner plates for railroad tunnels shall be galvanized and bituminous coated.
- c All work performed beneath existing structures, across railroad right-of-way, and under pavements shall be performed in accordance with the requirements of the parties or agencies having jurisdiction over these locations. The Contractor shall contact the parties or agencies prior to starting work and shall meet all requirements of the parties or agencies in regard to methods of construction and the safety precautions to be taken in performing the tunnel work. All costs involved in meeting these requirements shall be paid for by the Contractor and no additional compensation will be allowed.
- d At the Contractors option and with consent of the parties or agencies having jurisdiction, corrugated metal pipe, reinforced concrete pipe or steel pipe may be jacked or bored in place as a casing pipe in lieu of a liner plate tunnel under the following conditions:
 - i That the Contractor be responsible for all approvals from the parties or agencies having jurisdiction, that the Contractor furnish complete details of the methods to be employed for approval and that the work shall be performed under the following conditions.
 - ii Corrugated metal pipe shall be fabricated from corrugated galvanized sheets, at least number eight (8) gauge U.S.S. with base metal made by the open hearth process. Rivets shall be made of the same material as the base metal, thoroughly galvanized. The base metal sheets shall be galvanized on both sides by the hot dip process, at the rate of not less than two (2) ounces per square foot of metal, or one (1) ounce on each side. Corrugated pipe shall be especially fabricated for a jacking installation, with sections fabricated for field riveting. The pipe shall be furnished in lengths to suit the Contractor; however, the sections should be bituminous coated inside and outside for railroad crossings. Reinforced concrete pipe shall be of the tongue and grooved type, conforming to ASTM Designation C76, unless otherwise shown on the Contract Drawings, and/or designated in the Project Specifications. Steel pipe shall have a minimum wall thickness of 1/2 inch and shall be bituminous coated inside and outside for railroad crossings.
 - iii A suitable approach trench shall be opened, adjacent to the toe of the slope of the embankment. The approach trench shall be long enough to accommodate the length of pipe units to be placed, and wide enough to provide sufficient working room. Guide timbers or rails for keeping the pipe on line and grade shall be installed in the bottom of the trench, and heavy timber backstop supports installed at the rear of the trench to take the thrust of the jacks. A timber bearing or "pushing frame" shall be built and furnished to fit or match the end of the pipe to be jacked, so that the pressure of the jacks will be evenly distributed over the end of the pipe. Two (2) hydraulic jacks of sufficient power shall be used to apply pushing or jacking pressure. Excavation shall be carried on from inside the pipe, eight (8) to twelve (12) inches ahead of the lead pipe. Excavation at the top and sides shall be approximately one (1) inch greater than the outside periphery of the pipe. Bottom excavation shall be accurately cut to line and grade.

SANITARY SEWER

Adjoining sections of corrugated iron pipe shall be field riveted. Joints in reinforced concrete pipe shall be made with cement mortar and jute from the inside. Adjoining sections of steel pipe shall be welded. Pipe shall be jacked up grade. Once jacking operations are started, the work shall be carried on in successive shifts until completed, this to guard against the "freezing" of the line due to settlement and compaction of surrounding soil.

7 Pipeline Installation

- a. General shall conform with Standard Specification (MDOT) Sec 5-13.

8 Ductile Iron Pipe Joints

1. General

- a. Before any joints are made or the spigot of pipes placed in the bells, the spigots, bells, gaskets and glands shall be thoroughly cleaned and all foreign materials removed from their surfaces.
- b. In joining bell and spigot pipe and fittings, the spigot of each pipe shall be properly seated in the bell of the next adjacent piece and adjusted so as to give a uniform space for the joint, which shall be made with rubber gasket, and with lead as designated in Project Specifications.
- c. In joining mechanical joint pipe and fittings, the gland, followed by the gasket shall be placed over the plain end of the pipe, the gasket and socket brushed with soapy water and the pipe inserted into the bell. The gasket shall then be pushed into position so that it is evenly seated in the bell and the gland moved into position against the face of the gasket. The bolts shall be inserted and made finger tight. The bolts shall then be tightened up with a ratchet wrench to complete the joint.
- d. In joining gasket type pipe and fittings, the gasket shall be seated evenly around the inside of the bell in the groove or recess provided and the inside of the gasket lubricated with lubricant furnished by the joint manufacturer. The spigot of the next pipe shall then be aligned with the bell and started into the bell until it contacts the gasket. The joint shall then be completed by forcing the spigot past the gasket until it makes contact with the base of the socket. Pressure to force the spigot home shall be applied by means of a bar, a special lever or a mechanical jack-type assembly tool.

9 Factory-Fabricated Resilient Material Joints for Clay Pipe

In joining clay pipe with factory-fabricated resilient material joints, the bell and the spigot of the pipes shall be thoroughly cleaned, the joint material assembled on the spigot if it is made up of more than one part, the joint material for both bell and spigot coated with lubricant or adhesive, furnished by the joint manufacturer, the spigot entered into the bell and the pipe forced home by means of a bar or mechanical pipe puller.

10 Rubber Gasket Joints for Reinforced Concrete Low Head and Cylinder Pressure Pipe

In joining pipes of these types the ends of the pipes shall be thoroughly cleaned and the gasket furnished with the pipe placed in the groove or recess on the spigot, the gasket coated with a compatible bitumastic compound of a type recommended by the gasket manufacturer and the spigot entered into the bell and pipe forced home by means of a bar or mechanical winch. The remainder of the joint shall be filled with bituminous compound in the same manner as that specified for mortar and jute joints.

11 Connections for Service Pipes

General

SANITARY SEWER

- i Service connections for house sewer and/or drain connection openings shall be provided in the main sewers as shown on the Contract Drawings or as designated in the Project Specifications. The exact location shall be as directed by the Engineer during construction.
 - ii Unless otherwise shown on the Contract Drawings or so designated in the Project Specifications all sewer connection openings on bell and spigot pipe shall be "Y" branches, with the outlet being six (6) inches in internal diameter. All sewer connection openings on concrete pipe of the tongue and groove type shall be cast in place with the shape, size and dimensions of the opening corresponding to the bell end of a standard sewer pipe six (6) inches in internal diameter.
 - iii All connection openings shall be closed with a vitrified tile or concrete stopper, in the case of PVC pipe, a PVC stopper securely held in place with the same joint materials as that specified for the main sewer.
- e Construction
- i All excavation shall be carried out in compliance with the specifications for Excavation, Paragraph III-1.
 - ii "Y" branches for bell and spigot pipe with less than 8 feet from the surface of the ground to the center of the branch shall be laid horizontal with a slight fall across the branch. Connection openings on concrete pipe of the tongue and groove type shall be laid with the opening in the upper quarter of the pipe.
 - iii When the distance from the center of the connection openings is more than eight feet from the ground surfaces the connection openings shall be run outside the road at standard grade and then raised by means of riser pipes to a point less than 8 feet from the ground surface. Pipe risers for single connections shall be laid at an angle of from 45 degrees to 60 degrees with the horizontal depending on the side slope of the sewer trench, and shall be laid in undisturbed soil. Pipe risers for double connections shall be installed vertical with a double "Y" branch at the top with the branches placed crosswise of the main sewer. All openings shall be plugged with clay or concrete on PVC disks. Riser pipes and joints shall be of the same type as specified for the main sewer.
 - iv When sidewalks are available opposite the Sewer being constructed, the Contractor shall notch the street side of the walk directly opposite each opening left in the sewer for connection to building drains. Where walks are not available for such marking, the Contractor shall place a hardwood stake on the property line directly opposite each opening left in the sewer. The hardwood stake shall be topped with a brass marker labeled "Sewer". Also, the Contractor shall locate and keep a record of all opening locations by measurement to the nearest downstream manhole. Such record shall be delivered to the Engineer monthly during progress of the work.
- f Manholes
- i Precast Manholes (See Standard Detail Sheet in Drawings):
Precast manholes shall be precast concrete sections, as specified in the material section. The top cone shall be an eccentric section. The manhole cover shall be placed directly over the pipe, if possible.
 - ii Except for the one section on top, manholes shall all be 4 feet inside diameter. The base shall be leveled so that the manhole will be plumb and shall be low enough so the pipe may be constructed through the manhole. Holes for the pipe and intercepted laterals shall be cut in the sides of the manholes and thoroughly grouted.

SANITARY SEWER

- iii The Contractor shall use a jointing material which will prevent any leakage into the manhole. Cast iron manhole steps shall be included in the precast section of the manhole rings by the manufacturer. The manhole ring shall be adjusted over the cone section by the use of a minimum of 2 courses, and a maximum of four courses of sand lime brick, or approved equal well grouted, so that it will take up that portion of a foot necessary to be set to the grade, or future grade of the street, as directed by the Engineer. The manholes shall be sealed to not allow any infiltration. At the bottom of all manholes, a concrete trough shall be placed on the base (see Standard Detail Sheet). This concrete invert shall be troweled smooth and exactly to flow grade through the manhole. Specific items such as manhole covers, rings, steps, etc. are included on standard detail sheet.

12 Concrete Masonry Manholes

Manholes constructed of concrete blocks shall have their outer surface plastered from the bottom to the top with 1/2 inch of 1:2 cement mortar and shall have the following protection against infiltration:

Two coats of heavy asphalt waterproofing, applied hot, to a height from the bottom 2 feet above the water table (existing or potential) shall be applied to the outer surface of manholes constructed of concrete blocks. The asphalt shall be applied after the 1/2 inch of plaster has been allowed to cure.

The block manholes shall be equipped with steps, rings, covers, bricks, etc., as are the precast manholes described above.

13 Adjustment of Manholes

The contractor shall be responsible for the adjustment of all manholes so that they conform to the finish grade. These shall be adjusted to provide a water tight connection between the castings and the concrete structure of the manhole. This adjustment shall be incidental to the project.

14 Stubs Out of Manholes

The extension of all stubs out of the manholes shall be to a distance determined by the Engineer and/or as indicated on the plans. These stubs shall be securely plugged. to Contractor's construction operations.

All stubs shall be paid for according to the unit price per foot of sewer pipe and shall be payment in full for all labor and materials necessary for installation.

15 9. Appurtenances

- a Castings
- b All castings shall be set on full mortar beds on top of concrete or masonry.

16 As-Built Data

- a During construction, the Contractor with assistance from the Engineer or Engineer's representative shall make all measurements necessary for the preparation of a complete set of "As Built" drawings showing the exact location and elevation of all pipes, fittings, valves, hydrants, structures, sewers, manholes, and catch basins, in a manner acceptable to the Engineer.
- b The contractor shall provide a video tape of the sewer pipe upon completion of the project prior to its use.

SANITARY SEWER

The tape shall be standard color VHS cassette. The speed shall not exceed ____.

The record shall indicated position of all tap and record of location of manhole with a minimum of two measurement for accurate location.

V RESTORATION OF DISTURBED FACILITIES

1 General

When the work is completed on construction of Sewers, and Appurtenances, all surplus material, earth, rubbish, etc., shall be removed from the site of the work. That portion of the surface of each street disturbed by construction under this Contract shall be left in as good condition as it was before the commencement of the work, and it shall be promptly and regularly maintained in such condition during a period of one year after the acceptance of the work. This work of maintenance shall apply only to items of materials and workmanship improperly installed under this Contract, and maintenance measures made necessary by the ordinary wear and tear occasioned by traffic shall not be at the expense of the Contractor. However, any repairs required because of the unsatisfactory trench backfilling shall be at the expense of the Contractor.

2. Pavement, Curbs, Curbs and Gutters

- a In all streets or parts of streets or other areas that paved or concrete surfaces all backfilling shall be compacted to 95% of maximum dry density. After the trench or excavation has been backfilled to the required height the subgrade for the new paving, curb and/or curb and gutter shall be further compacted by rolling and backfill at subgrade elevation. After examination by the Engineer of the backfill and subgrade compaction, the pavement, curb and/or curb and gutter shall be replaced.
- b All pavements curbs and curbs and gutters shall be replaced to the section and of the same materials as that removed in accordance with the Owners established standards or in their absence to the Standards of the Michigan Department of Transportation.

3. Driveways and Sidewalks

- a. The backfill and subgrade for all driveways and sidewalk replacement shall be compacted in the same manner as that specified for pavements. All edges broken from driveways and sidewalks shall be sawed or cut off at right angles to the driveway or sidewalk and after approval of Engineer replaced.
- b. All driveways and sidewalks shall be replaced to the section and of the same materials as that removed in accordance with the Owners established standards for similar work.

4. Turf Establishment

- a All specifications on seeding, sodding, etc. will be followed according to Section 6.53 "Turf Establishment" in the 1984 or latest revision of the Standard Specifications for Construction, by Michigan Department of Transportation. Methods of measurement and payment will be by the square yard of topsoil, seed, fertilizer and mulch in place or by the square yard of topsoil and sod in place. The Contractor will be required to thoroughly water the seeding or sodding once immediately after installation; thereafter it will be the property owner's responsibility to water it. Watering will be considered incidental to the unit price of seeding or sodding.

5 Trees

- a General shall conform with Standard Specification (MDOT) section 6.50.

V COMPLETION OF CONTRACT

1 General

- a It is the intent of these specifications to secure pipelines with a minimum amount of leakage. Ductile iron and reinforced concrete pressure pipe shall be hydrostatic pressure tested. All gravity pipe lines shall be tested for infiltration and/or for exfiltration, and/or air pressure tested. All PVC pipe will also be tests for deflection.

2 Water Infiltration Tests

- a If more than a trace of water is flowing, weirs will be placed at manholes to determine the amount of infiltration. The contractor shall provide the Engineer with labor and material for construction of these measuring devices. The maximum infiltration allowed will be 200 gallons per day per inch of pipe diameter per mile of pipe. If requested by the Engineer, the test shall be performed and the allowable computed for each manhole interval.
- b If more than a trace of water is flowing between manholes a V-notch weir shall be used at the downstream end of each manhole and a reading taken and recorded. Only weirs that give the actual reading at the crest of the weir shall be used and only the proper weir designated for the particular pipe size under test shall be used.

3 Water Exfiltration Tests

- a The maximum exfiltration allowed will be 200 gallons per day per inch of pipe diameter per mile of pipe, plus an additional allowance of 10 percent for each additional 2 feet of head above the initial 2 foot water level as set forth in Article 5.01 (c) 4 of these specifications.
- b All wyes, tees and stubs shall be plugged with flexible jointed caps, or acceptable alternate, securely fastened to go withstand the internal test pressure. Such plugs or caps shall provide a socket suitable for making a flexible lateral connection or extension.
- c The section of sewer to be tested shall be sealed by inserting inflatable rubber bags in the pipes or by other means approved by the Engineer, and then water shall be introduced into a manhole until the section is completely filled. The Contractor shall fill the pipe to the test level at least 4 hours prior to the time of exfiltration testing to permit normal absorption into the pipe walls. All entrapped air must be removed from the test section prior to performing the test.
- d Throughout the test period of at least 1 hour, the water level in the upper manhole shall be maintained at least 2 feet above the crown of the upper end of the pipe or at least 2 feet above the ground water table, whichever is higher. The length of pipe tested shall be limited so that the pressure on the center line of the lower end of the section tested shall not exceed 12 feet of water column.

4 Air Exfiltration Tests

- a The pipe shall be subjected to an initial pressure of not greater than 4 psi for a minimum of 2 minutes to stabilize temperatures of the compressed air. After stabilization has taken place, the pressure shall be 3.5 psi, or greater, but not more than 4 psi, and all air valves closed.
- b The interior walls of the pipe may be dampened by flushing a "ball" through the interval to be tested if the contractor so chooses.

SANITARY SEWER

- c The maximum allowable air leakage shall be 0.0030 cmf per square feet of internal pipe surface tested at an average pressure of 3.0 psi greater than the average back pressure of any ground water that may submerge the pipe.
- d In areas where ground water is known to exist, the contractor and Engineer shall determine the extent of ground water over the invert of the pipe and apply additional pressure to the test pressure as follows:

<u>Extent of ground water over invert of pipe</u>	<u>Pounds of pressure to be added to test pressure</u>
1 feet	0.5
2 feet	0.8
3 feet	1.3
4 feet	1.7
5 feet	2.1
6 feet	2.6
8 feet	3.4
10 feet	4.3
12 feet	5.2
14 feet	6.1
16 feet	6.9

- e If the pressure does not fall below 2.5 psi from 3.5 psi in the following situations, the pipe will be accepted. The length of pipe shall be any length between manholes. Additional time allowed for house service laterals shall be added to this time as computed by the formula shown below for the length and size present:

<u>Size (inches)</u>	<u>Time allowed for pressure to drop from 3.5 to 2.5 psi</u>
6	3 minutes
8	4 minutes
10	5 minutes
12	5-1/2 minutes
15	7-1/2 minutes
18	8-1/2 minutes
21	10 minutes
24	11-1/2 minutes
27	13 minutes
30	14-1/2 minutes
33	15-1/2 minutes
36	17 minutes

If the pipe does not meet the above test, the time shall be computed by the following expression:

time in seconds = $T = k/c^2$ where $k = 0.011 d L$

$c = 0.0003883 dL$ (if c is 1, or less, use value of 1 for c)

t = time in seconds for air pressure inside of pipe to decrease from 3.5 to 2.5 psi

d = inside pipe diameter of pipe under test (inches)

L = length of pipe under test (feet)

5 Forcemain

SANITARY SEWER

a General

The Contractor shall pretest and be satisfied that all lines are ready for testing before requesting test inspection.

(i) Pressure Testing

The Contractor shall provide all necessary equipment and perform all work required in connection with the tests. All pipe shall be tested under a hydrostatic pressure range of 150 psi. Each section shall be slowly filled with water, care being taken to expel all air from the pipes. If necessary, pipes shall be tapped at high points to vent the air.

The required pressure (150 psi) shall be applied for not less than 2 hours and all pipe, fittings, valves and joints shall be carefully examined for defects. Cracked or defective pipe fittings and valves shall be replaced by the Contractor with sound material at no cost to the Owner, and the test repeated. Where actual visual inspection of each joint cannot be made because of the necessity for immediate backfilling, or where the pipe is placed below water level, suitable means shall be provided by the Contractor for determining the quantity of water lost by leakage under the required test pressure.

Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof, to maintain the specified leakage test pressure after the air in the pipeline has been expelled and pipe has been filled with water.

No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{SD(P)^{\frac{1}{2}}}{133,320}$$

in which L is the allowable leakage, in gallons per hour; S is the length of the pipe tested; in feet; D is the nominal diameter of the pipe, in inches; and P is the average test pressure during the leakage test, in pounds per square inch gauge in formula is based on an allowable leakage of 11.65 gpd, per mile, per inch nominal diameter at a pressure of 150 psi.

For convenience, the following table of allowable leakage per 1,000 feet of pipeline in gallons per hour has been prepared:

Avg. Test Pressure (PSI)	Nominal Pipe Diameter-In.					
	6	8	10	12	16	20
150	0.55	0.74	0.92	1.10	1.47	1.84

6 Deflection Testing (PVC Pipe)

Deflection testing shall be performed on PVC sewer no less than thirty days after placement of the final backfill. No pipe shall exceed a deflection of 5 percent.

7 Responsibility

a General

SANITARY SEWER

Sewers must be built so as to remain true to line and grade. The inclining grade of the bottom of the sewer after completion shall be such that after flooding the flood water will drain off so that no remaining puddle of water will be deeper than one-half (1/2) of an inch on pipe thirty-six (36) inches internal diameter or smaller, and three-quarters (3/4) of an inch on pipe larger than thirty-six (36) inches internal diameter. Any section of pipe that does not comply with the specifications at any time previous to final acceptance of the work shall be replaced or relaid at the Contractor's expense.

The Contractor will be held strictly responsible that all parts of the work shall bear the load of the backfill. If cracks one-hundredth (1/100) of an inch develop in the pipe within one year from the date of final acceptance of the work, the Contractor will be required to replace, at his expense, all such cracked pipe. To this end, the Contractor is advised to purchase pipe under a guarantee from the manufacturer, guaranteeing proper service of sewer pipe under conditions established by the Contract Drawings, Contract Specifications, and local conditioning at the site of the work.

VI MEASUREMENT FOR PAYMENT AND COMPENSATION

1 General

If any of all of the work to be performed under this Contract is on a unit price basis, the actual number of units of each unit price item of work actually performed may be more or less than the number stated in the Bidding Schedule of the Proposal, or included in the Contract, but no variation in the Contract unit price will be made on that account. Payment will be made only for the actual number of units of incorporated in the work, or for the actual number of units of work performed, and at the Contract unit price for each such unit with measurement for payment made as defined in the following paragraphs. Measurement for payment of work done on a unit price basis will be as follows.

2 Pressure Pipeline

Measurement of pressure pipelines and services, whether ductile iron, concrete, or other materials, will be made along the centerline of pipe, whether curved or straight, measured in place, and will include the laying length of valves, fittings and specials.

3 Fittings and Specials

Unless otherwise specifically provided in the Project Specifications the cost of furnishing and placing specials and fittings shown on the Contract Drawings and/or called for in the Project Specifications shall be merged in the unit prices for the pressure pipeline, and will not be paid for separately.

4 Gravity Sewers, Conduits, Culverts and Drains

Measurement of gravity sewer lines, conduits, culverts and drains will be made along the centerline of the line, whether curved or straight, measured in place.

On sewers of thirty-six (36) inches or less internal diameter measurement will be made through manholes. On sewers larger than thirty-six (36) inches internal diameter measurement will start and terminate at the inside face of manholes or structures.

Measurement on catch basin sewer connection leads will be made from the centerline of the basins to the centerline of the manholes or sewers; measurement of sewer leads between inlet boxes and catch basins will be made from the inside wall of the inlet box to the centerline of the catch basin. Half traps and running traps will be included in the above measurement and will not be paid for separately.

5 Manholes

Manhole Parts by Payment

SANITARY SEWER

1. Bases from the underside of foundation to the start of the circular sidewalls, including all fillets, to the details shown on the Contract Drawings will be paid for at the Contract unit price for each unit installed.
2. Circular sidewalls, including manhole steps, measured from the top of the base to the underside of the cast iron frame, will be paid for at the Contract unit price per vertical foot for each vertical foot installed.
3. Frame and cover will be paid for at the Contract unit price for each unit installed of each type and weight.
4. Payment for Complete Manhole
5. Manholes will be paid for at the Contract unit price for each unit completely installed.
6. Drop pipe assemblies will be paid for at the Contract unit price for each complete assembly installed including concrete encasement.

6 Rock Excavation

For structural work will be measured to a plan three (3) inches below the bottom of the structural foundation, and for a distance of one (2) foot outside the horizontal limiting dimensions of the foundation. Measurements for rock excavation for pipe or conduit will be a plan six (6) inches below the bottom of the outside of the pipe, and a width equal to four-thirds ($4/3$) the inside diameter of the pipe, plus twelve (12) inches. No allowance will be made for rock excavation in excess of the limits above described.

7 Timber Piling

Will be measured for the actual piling lengths furnished and installed. Cut off tops will not be included in footage measured for payment. The Contractor shall merge in the unit price bid for piling, the extra cost of furnishing and placing one (1) test pile.

8 Timber Sheeting, Bracing and Cradles

Will be measured in Feet Board Measure based on the nominal size of the plank or timber furnished multiplied by the lineal feet left in place. The cost of cutting, mortising, spiking or bolting shall be included in the price bid per thousand feet board measure of timber furnished and placed.

9 Concrete Cradle and Encasement

Will be measured in cubic yards, based on the lineal feet of cradle or encasement furnished and placed on each pipe size, multiplied by the cubic yards per lineal foot for each pipe size indicated in the cradle tabulation or shown on the encasement cross-sections included in the Contract Drawings. The unit bid and Contract price for cradle or encasement shall include the cost of removing and disposing of the added excavation required to accommodate these materials.

10 Crushed rock or Gravel Refill

Will be ordered placed under pipelines and/or structures will be measured on the basis of the actual number of cubic yards ordered furnished and placed.

11 Sand or Gravel Trench Backfill

Will be measured on the basis of the lineal feet of trench backfilled multiplied by the standard trench width in feet ($4/3$ the internal pipe diameter plus 8 inches), multiplied by the average depth of fill placed from a plane 12 inches above the top of the pipe. The unit bid and Contract price shall include the cost of disposition of the material excavated from the trench and the furnishing, placing and compacting of the sand or gravel backfill.

12 Pavement Replacement

SANITARY SEWER

Measured for the replacing of pavement disturbed during construction of sewers or pressure pipelines will be based on the width of the trench equal to twice the inside diameter of the pipe installed plus 12 inches. Payment for pavement replacement over manholes and structures will be made only for an area twelve (12) inches beyond the horizontal limiting dimensions of the base. Any pavement disturbed beyond the above-described limits must be replaced at the Contractor's expense.

13 Sidewalk, Driveways and Curb and Gutter Replacement

Measured for replacing sidewalks and/or driveways necessary to be disturbed during construction of sewers or pressure pipelines will be based on the actual number of square feet of sidewalk and/or driveways replaced. Similarly, concrete curb and gutter replaced will be paid for on the basis of the actual number of lineal feet of curb and gutter necessary to be disturbed and replaced. For details of methods and materials used in the replacement of Sidewalk, Driveways and Curb and Gutter see General Specifications entitled Curb and Gutter, Driveways, and Sidewalks.

14 Ductile Iron Pipe and Fittings for Raising or Lowering Watermains will be done by City Forces.

15 Relocation of Water Service Pipes will be done by City Forces.